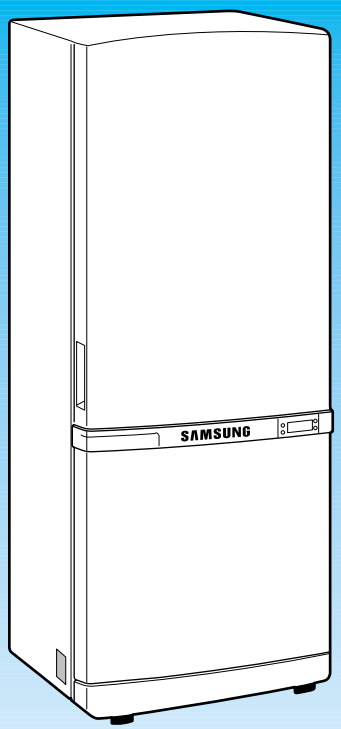
SAMSUNG

SAMSUNG Home Appliance Service

SERVICE GUIDE

Bottom-Mounted Freezer



Model:
RB1844SW
RB1844SL

SAM0050

WARNING

IMPORTANT SAFETY NOTICE

The service guide is for service men with adequate backgrounds of electrical, electronic, and mechanical experience. Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or dealer cannot be responsible for the interpretation of this information.

SAMSUNG ELECTRONICS AMERICA, INC.

Technical Service Guide

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1. INSTALLATION

1) To protect refrigerator in movement
Use padded hand truck from side only.

2) Remove all protective tape and pad from the refrigerators.
Connect power cord. Adjust the clearance between the doors.

3) Temperature controls ard preset in the factory for recommended settings.
The refrigerator should runs smoothly and lower the temperature gradually.

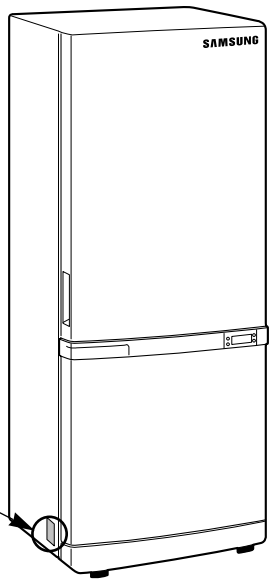
4) Once the refrigerator temperature is sufficiently low
It is recommended to store foods in the refrigerator.
It takes a few hours to reach the preset temperatures.

2. NOMENCLATURE

2003 Models

R B 20 44 SW / XAA

- XAA — Company Name
- SW — COLOR ; SW-SNOW WHITE SL-NOBLE GRAY
- 44 — OPTION ; 44-NO DISPENSER
- 20 — Capacity ; CU. FT
- B — B - BOTTOM MOUNTED FREEZER (BMF)
- R — Product ; R - REFRIGERATOR



3. PRODUCT SPECIFICATIONS

Model		RB1844SW	RB1844SL	RB2044SW	RB2044SL
Type		BMF 2 Door			
Temperature control		Electronic control			
Net Capacity (ft^3)	Total	18.7	18.7	20.4	20.4
	Freezer	5.9	5.9	6.5	6.5
	Refrigerator	12.8	12.8	13.9	13.9
Net dimension (W X D X H)		32.3 X 28.3 X 69.9		32.3 X 30.3 X 69.9	
Foam	Cabinet insulation	CYCLO-PENTANE			
	Door insulation	CYCLO-PENTANE			
Liner	Cabinet	A.B.S			
	Door	A.B.S			
Net weight(lb)		227	227	241	241

4. ELECTRICAL PART SPECIFICATIONS & STANDARD

ITEM		STANDARD			
Model		RB1844SW	RB1844SL	RB2044SW	RB2044SL
Rated Voltage		115V			
Frequency		60HZ			
Compressor	Model	MK172C-L2U			
	Starting type	RSCR			
	Refrigerant	R134a			
	Oil Charge	Freol α-10c(Ester), 265cc			
Evaporator	Freezer	Split Fin & Tube Type			
	Refrigerator	Split Fin & Tube Type			
Condenser		Forced & Natural Convection Type			
Dryer		Molecular Sieve XH-9			
Capillary tube		ID0.82 X L3000			
Earth screw		BSBN(Brass screw)			
Door switch		AC125V 1.4A(SSD-6D)			

ELECTRICAL PART SPECIFICATIONS & STANDARD

ITEM				STANDARD	
Temperature	Freezer	Type	Temperature Selection	ON(˚F)	OFF(˚F)
		F-Sensor	–14˚F	–12.0˚F	–16.0˚F
			–2˚F	0˚F	–4˚F
			8˚F	10˚F	6˚F
	Refrigerator	Type	Temperature Selection	ON(˚F)	OFF(˚F)
		R-Sensor	34˚F	36˚F	32˚F
			40˚F	42˚F	38˚F
			46˚F	48˚F	44˚F
Electrical parts	Defrosting	First Defrost Cycle (Concurrent Defrost of F and R)		4hr ±10min	
		Defrost Cycle(FRE)		Min. 12hrs, Max. 22Hrs	
		Defrost Cycle(REF)		Min. 6hrs, Max. 11Hrs	
		Pause Time		10±2min	
	Sensor	Freezer-Sensor		THERMISTOR (502AT), SPEC:5.0KΩ AT 77˚F	
		Refrigerator-Sensor			
		FRE Evap-Sensor			
		REF Evap-Sensor			
		Ambient TEMP-Sensor			
	Heater	Defrost Heater(FRE)		242W	
		Drain Heater(FRE)		52W	
		Defrost Heater(REF)		120W	
		Drain Heater(REF)		38W	
	Fuse	Thermal-Fuse for preventing overheating of Freezer Defrost-Heater		AC250V 10A 77±5˚C	
		Thermal-Fuse for preventing overheating of Freezer Defrost-Heater			
	Capacitor	RUNNING		RSCR 250VAC, 12㎌	
	Over-Load Protector	MODEL		4TM437RHBYY-53	
		TEMP. ON		130±5	
	STARTING-RELAY	TEMP. OFF		69±9	
		MODEL		J531Q33E100M200-2	
		OPERATION		10±20%	
	MOTOR-FAN	FRE.		IS3210-SNP6D	
		REF.		IS3208-SNP6H	
		CIRCUIT		IS3208-SCH6A	
	LAMP	FRE(INCANDESCENT)		110V-130V/15W	
		REF(INCANDESCENT)		110V-130/30W	

5. WARRANTY INFORMATION

SAMSUNG REFRIGERATOR
(18 Cubic Feet and Larger Capacity)

LIMITED WARRANTY TO ORIGINAL PURCHASER

This SAMSUNG brand product, as supplied and distributed by Samsung Electronics America, Inc. (SAMSUNG) and delivered new, in the original carton to the original consumer purchaser, is warranted by SAMSUNG against manufacturing defects in materials and workmanship for a limited warranty period of:

One (1) Year Parts and Labor on Refrigerator
Five (5) Years Parts and Labor on Sealed Refrigeration System Only*
(*Compressor, evaporator, condenser, drier, connecting tubing)

This limited warranty begins on the original date of purchase, and is valid only on products purchased and used in the United States. To receive warranty service, the purchaser must contact SAMSUNG for problem determination and service procedures. Warranty service can only be performed by a SAMSUNG authorized service center. The original dated bill of sale must be presented upon request as proof of purchase to SAMSUNG or SAMSUNG's authorized service center.

SAMSUNG will repair or replace any part found to be defective, at our option and at no charge as stipulated herein, with new or reconditioned parts during the limited warranty period specified above. All replaced parts and products become the property of SAMSUNG and must be returned to SAMSUNG. Replacement parts and products assume the remaining original warranty, or ninety (90) days, whichever is longer.

In-home service will be provided during the warranty labor period subject to availability within the contiguous United States. In-home service is not available in all areas. To receive in-home service, the product must be unobstructed and accessible from floor level to service personnel. If during in-home service repair cannot be completed, it may be necessary to remove, repair and return the product. If in-home service is unavailable, SAMSUNG may elect, at our option, to provide for transportation of our choice to and from a SAMSUNG authorized service center. Otherwise, transportation to and from the SAMSUNG authorized service center is the responsibility of the purchaser.

This limited warranty covers manufacturing defects in materials and workmanship encountered in normal, noncommercial use of this product, and shall not apply to the following, including, but not limited to: damage which occurs in shipment; delivery and installation; applications and uses for which this product was not intended; altered product or serial numbers; cosmetic damage or exterior finish; accidents, abuse, neglect, fire, water, lightning or other acts of nature; use of products, equipment, systems, utilities, services, parts, supplies, accessories, applications, installations, repairs, external plumbing and leaks, external wiring, circuit breakers, fuses or connectors not supplied and authorized by SAMSUNG, or which damage this product or result in service problems; incorrect electrical line voltage, fluctuations and surges; customer adjustments and failure to follow operating instructions, cleaning, maintenance and environmental instructions that are covered and prescribed in the instruction book; loss of food due to spoilage; consumable items including filters and light bulbs.

THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE LISTED AND DESCRIBED ABOVE, AND NO WARRANTIES WHETHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY AFTER THE EXPRESS WARRANTY PERIODS STATED ABOVE, AND NO OTHER EXPRESS WARRANTY OR GUARANTY GIVEN BY ANY PERSON, FIRM OR CORPORATION WITH RESPECT TO THIS PRODUCT SHALL BE BINDING ON SAMSUNG. SAMSUNG SHALL NOT BE LIABLE FOR LOSS OF REVENUE OR PROFITS, FAILURE TO REALIZE SAVINGS OR OTHER BENEFITS, OR ANY OTHER SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES CAUSED BY THE USE, MISUSE OR INABILITY TO USE THIS PRODUCT, REGARDLESS OF THE LEGAL THEORY ON WHICH THE CLAIM IS BASED, AND EVEN IF SAMSUNG HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. NOR SHALL RECOVERY OF ANY KIND AGAINST SAMSUNG BE GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT SOLD BY SAMSUNG AND CAUSING THE ALLEGED DAMAGE. WITHOUT LIMITING THE FOREGOING, PURCHASER ASSUMES ALL RISK AND LIABILITY FOR LOSS, DAMAGE OR INJURY TO PURCHASER AND PURCHASER'S PROPERTY AND TO OTHERS AND THEIR PROPERTY ARISING OUT OF THE USE, MISUSE OR INABILITY TO USE THIS PRODUCT SOLD BY SAMSUNG NOT CAUSED DIRECTLY BY THE NEGLIGENCE OF SAMSUNG. THIS LIMITED WARRANTY SHALL NOT EXTEND TO ANYONE OTHER THAN THE ORIGINAL PURCHASER OF THIS PRODUCT, IS NONTRANSFERABLE AND STATES YOUR EXCLUSIVE REMEDY.

Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

To obtain warranty service, please contact SAMSUNG at:

SAMSUNG CUSTOMER CARE CENTER
400 Valley Road, Suite 201, Mt. Arlington, NJ 07856, Tel: 973-601-6000, Fax: 973-601-6001
1-800-SAMSUNG (1-800-726-7864) and www.SAMSUNGUSA.com

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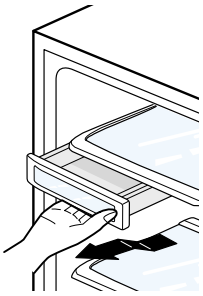
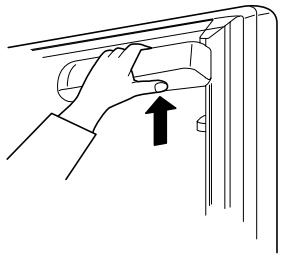
6. Interior Views and Dimensions

6-1) Shelves and Bins

• Deli drawer
Pull it out to disassemble.

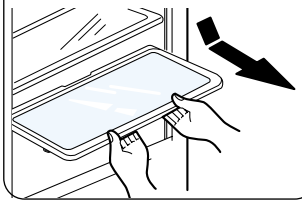


• Door Bin
Push it up and slide it out to disassemble.



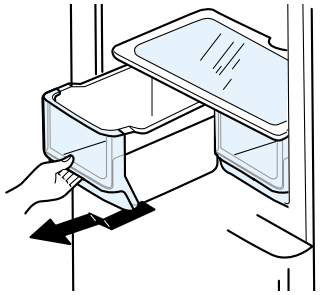
Light

• Glass Shelf
Pull it out until its stop
Tilt down and slide it out.

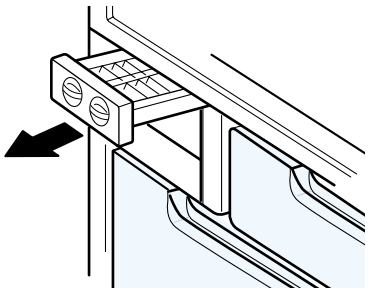


• Gallon Bin

• Vegetable Drawer



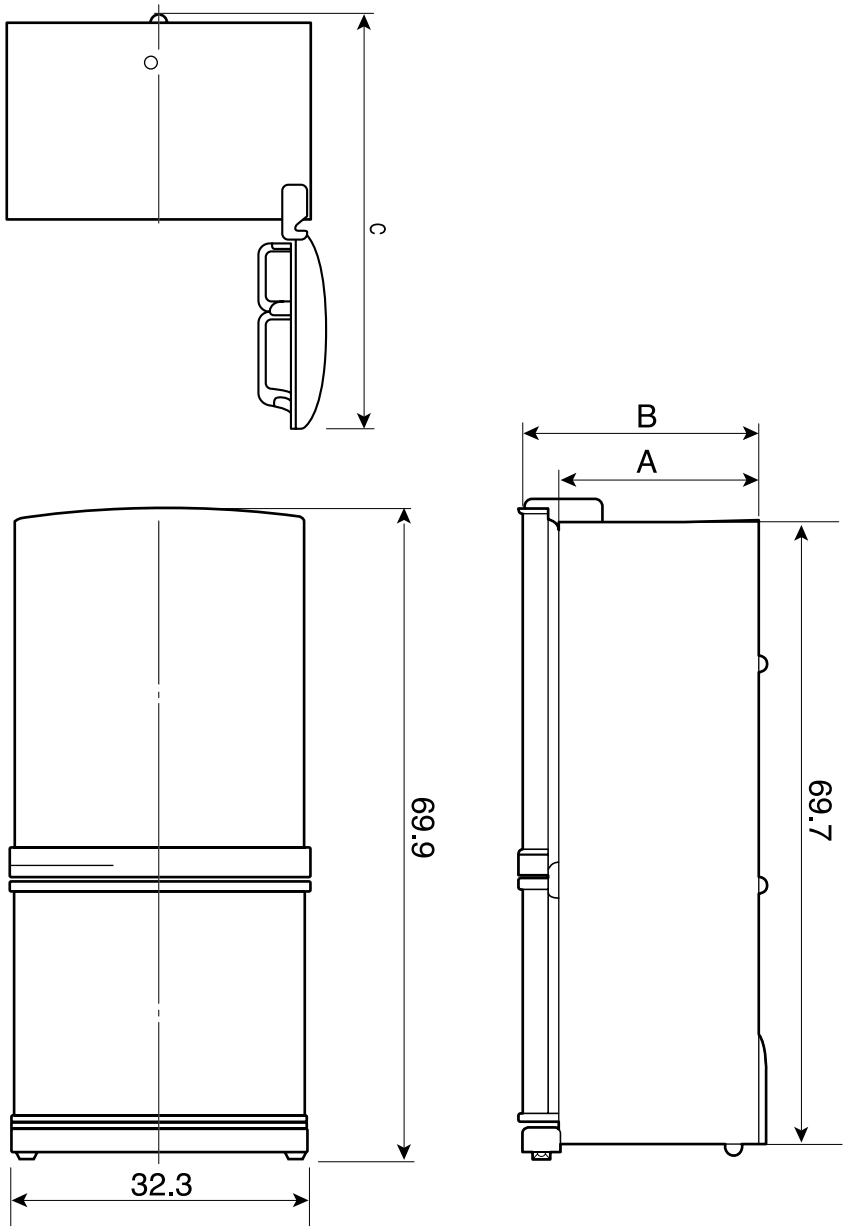
• Ice trays



• Freezer Drawer

Interior Views and Dimensions

6-2) Dimensions of Refrigerator (Inches)

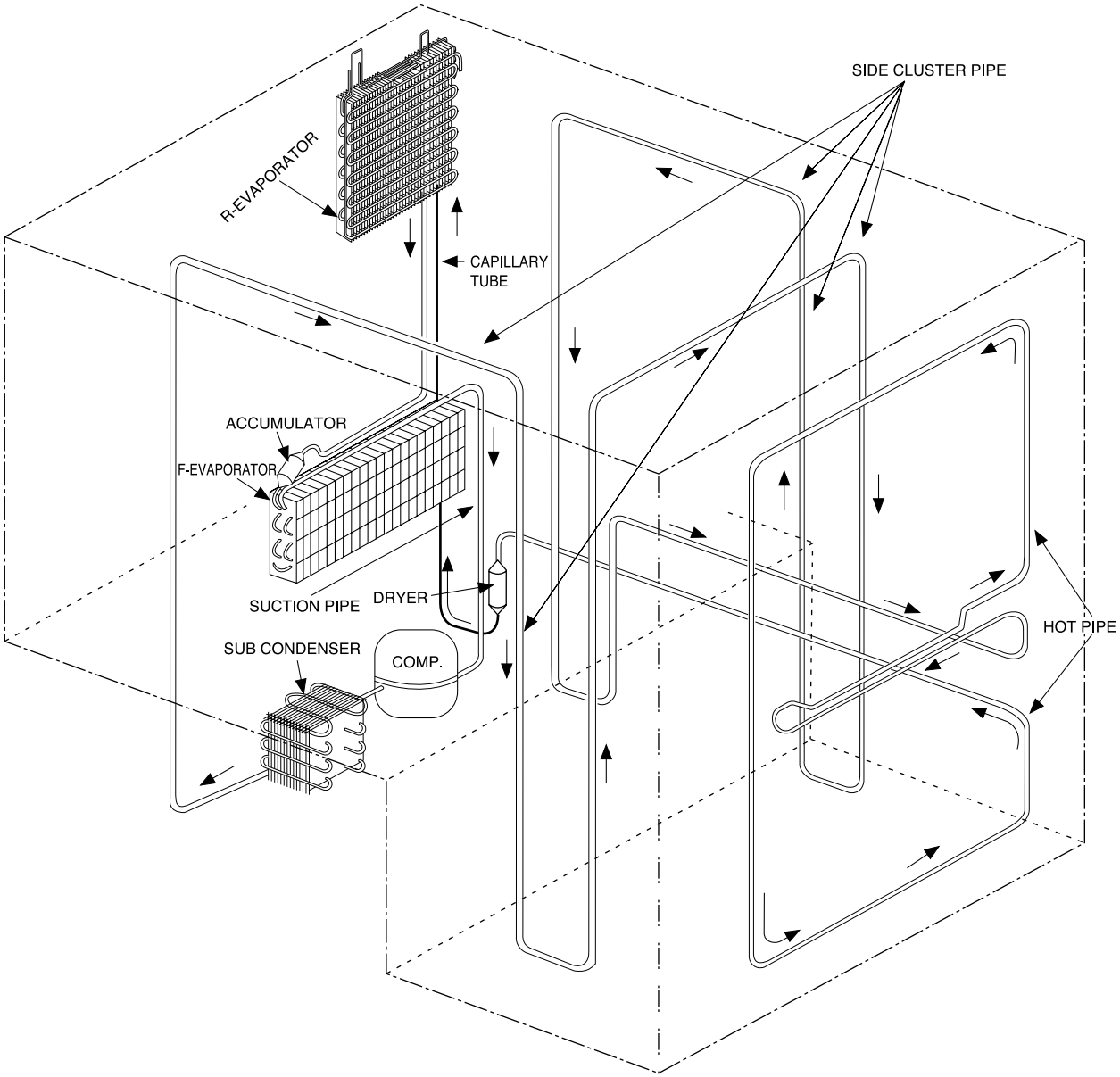


MODEL	A	B	C
RB1844	24.3	28.3	57.8
RB2044	26.3	30.3	59.8

7. Refrigeration Cycle and Cool Air Circulation Route

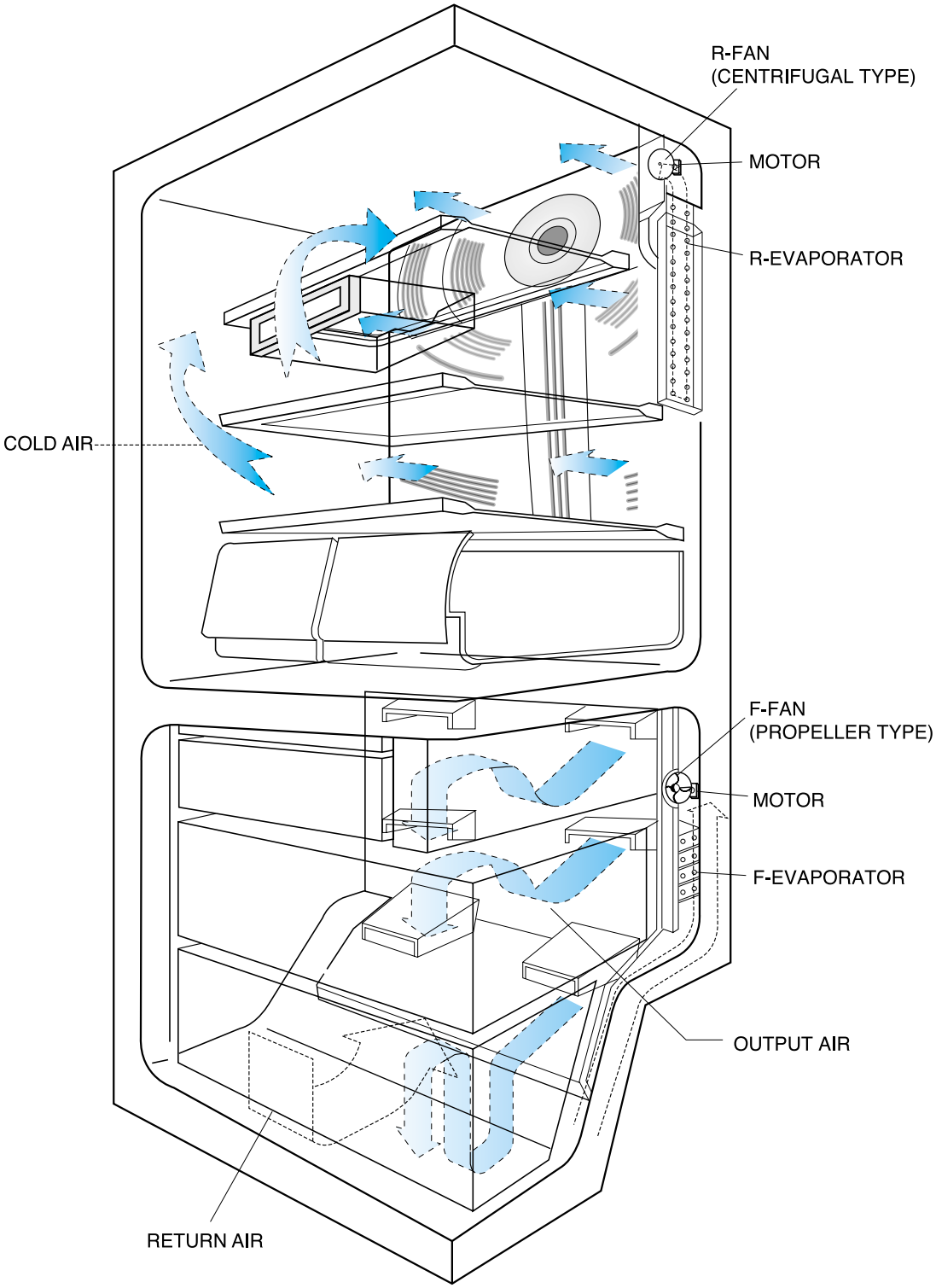
7-1) Refrigerant Route in Refrigeration cycle

Compressor → Sub condenser → Cluster pipe → Hot pipe → Dryer → Capillary tube → R-Evaporator → F-Evaporator → Accumulator → Suction pipe → Compressor



Refrigeration Cycle and Cool Air Circulation Route

7-2) Cool Air Circulation



8. Mechanical Disassembly

Refrigerator Disassembly

Control Panel 13

Refrigerator Light 14

Freezer Light 14

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Evaporator Cover in the Freezer 16

Evaporator in the Freezer 17

Evaporator in the Refrigerator 17

Machine Compartment & Electric Box 18

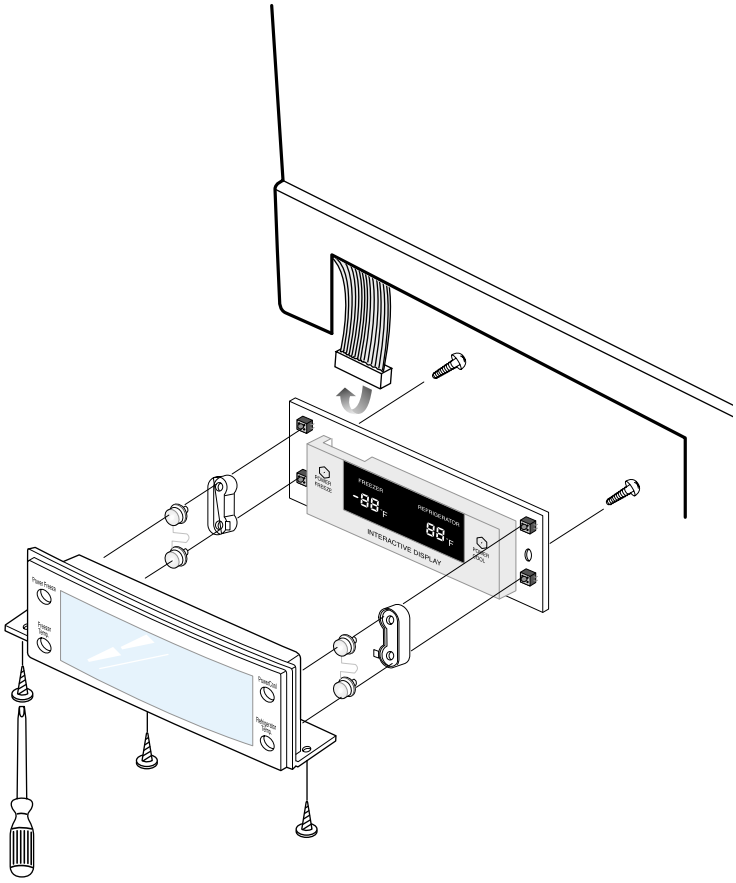
Mechanical Disassembly

Control Panel

1. Remove the screws.

2. Pull out the control panel.

3. Disconnect the wire connector.



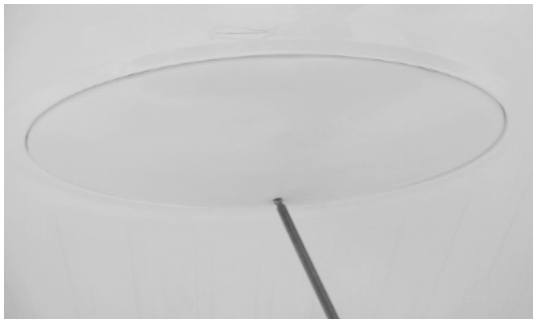
Mechanical Disassembly

Warning

Always unplug the power cord before replacing the refrigerator lamp.
There is the danger of electric shock.

Refrigerator Light

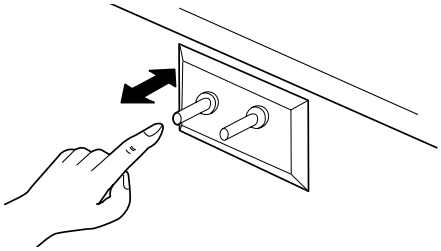
1. Remove the screw.



2. Remove the lamp cover by unlocking the tabs and pulling the cover down.

3. Replace the lightbulb by turning it counter-clockwise.

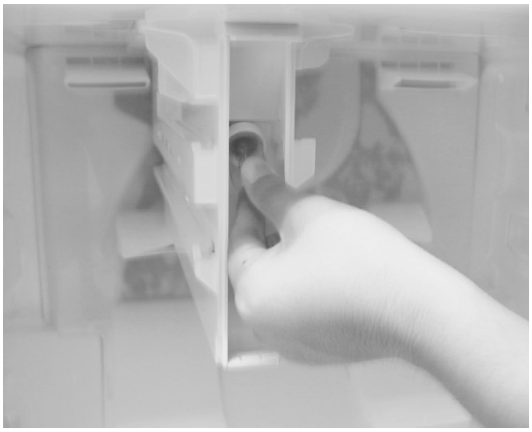
4. After replacing the bulb, reattach the cover and the screw it again.
5. Plug the power cord in and check the lamp by pressing the R-door switch.



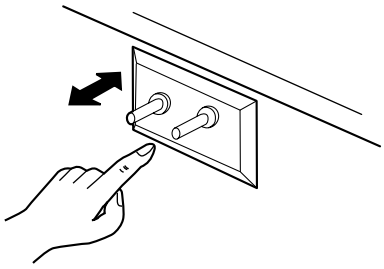
Freezer Light

1. Remove the cover by pressing the bottom tab.

2. Replace the lightbulb by turning it counter-clock wise.



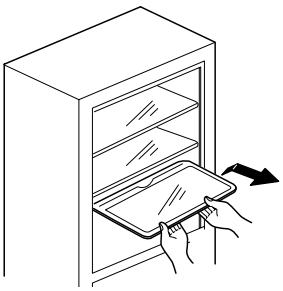
3. Reattach the cover and check the lamp by pressing door switch.



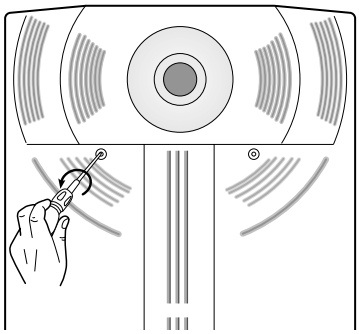
Mechanical Disassembly

Evaporator Cover in the Refrigerator

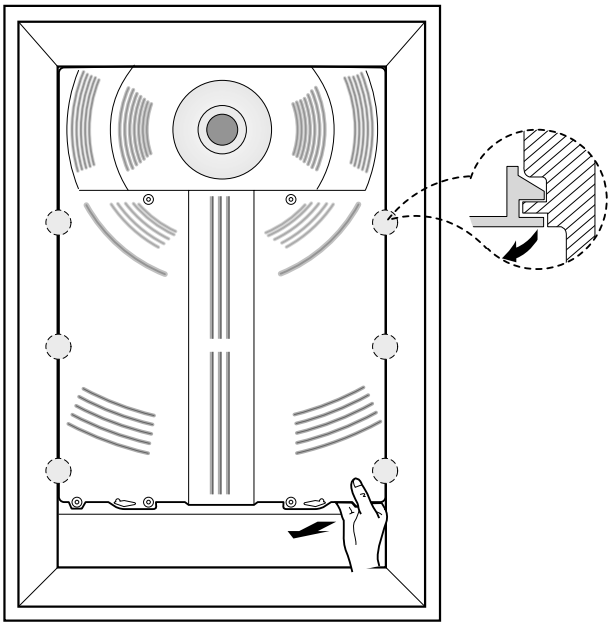
1. Remove all shelves and drawers from the refrigerator.



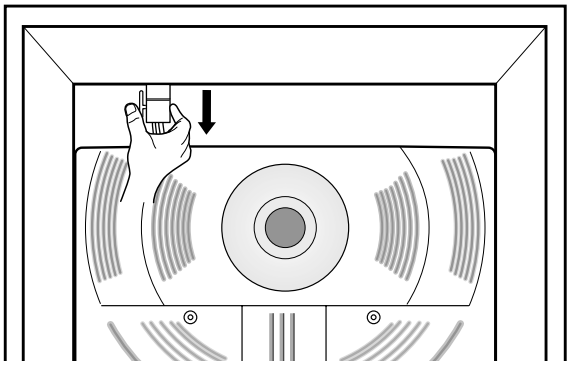
2. Pull out the screw caps with a small flat-blade screwdriver.
3. Remove 6 Phillps screws from the cover.



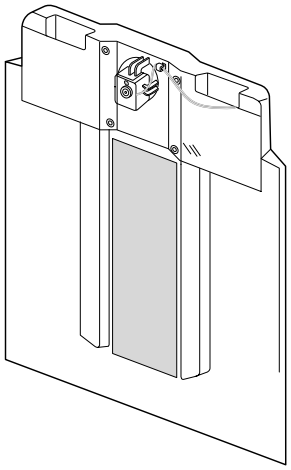
4. Unlock the 2 tabs with a flat-blade screwdriver on each side of the bottom cover.
5. Remove the evaporator cover by pulling out from the bottom of the evaporator cover.



6. Disconnect the wire connector.



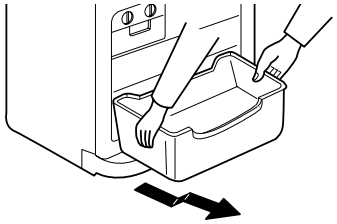
■ Ductwork of the evaporator fan assembly.



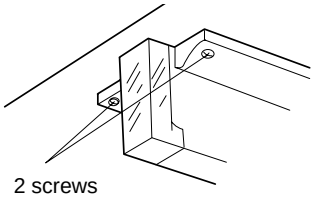
Mechanical Disassembly

Evaporator Cover in Freezer

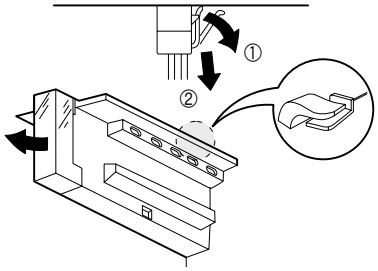
1. Remove all drawers from the freezer.



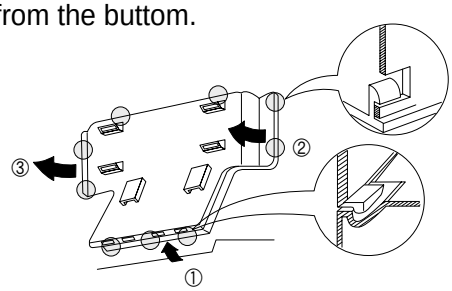
2. Remove screws (2) from the support rail.



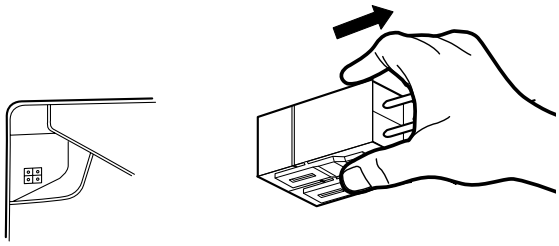
3. Pull down the holder of the support rail and disconnect the wire connector to remove it.



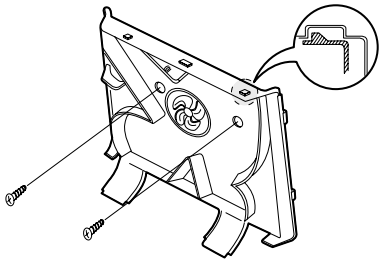
4. Unlock the tabs around the evaporator cover from the buttom.



5. Disconnect wire connector from the top-left corner.



6. Remove 2 screws from the rear cover of the freezer evaporator and unlock the tabs to remove it.

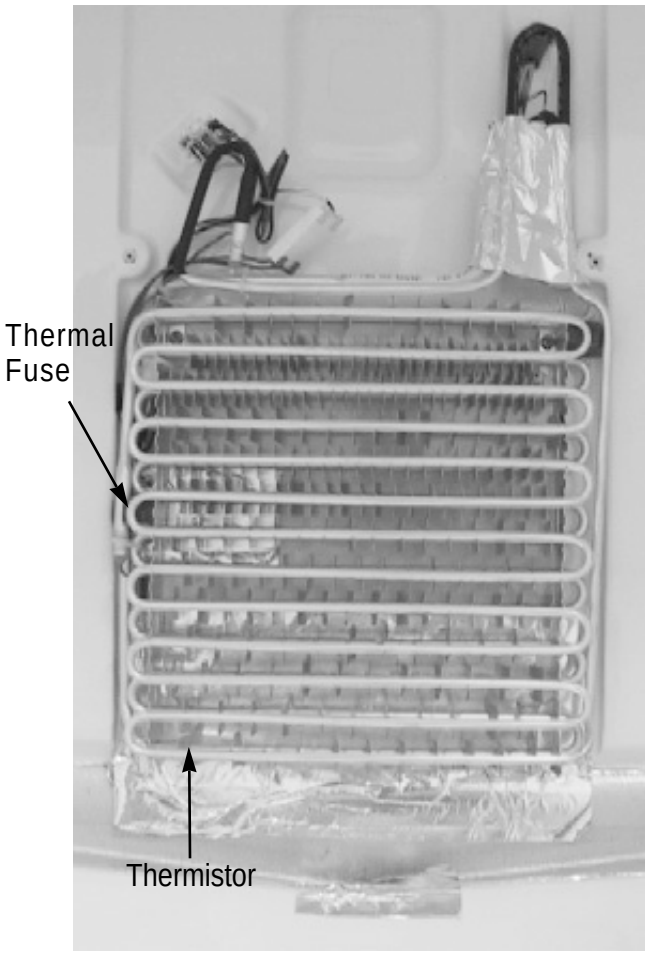


Mechanical Disassembly

Evaporator in Refrigerator

Evaporator is located in the bottom of refrigerator.

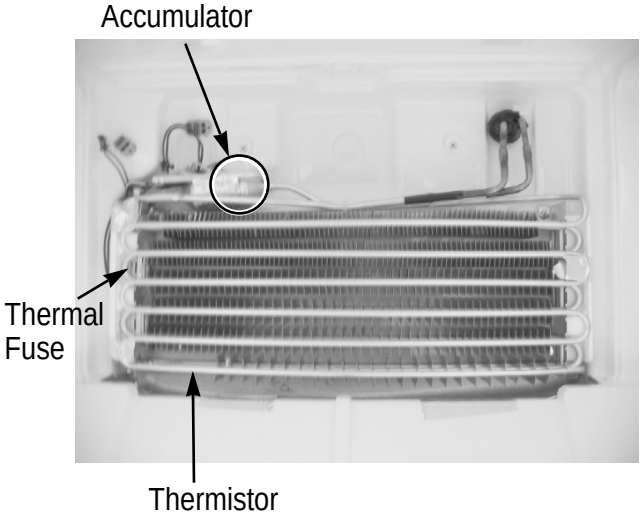
1. Take off the ductwork in refrigerator.
2. Disconnect the wire connector.(Heater and Thermistor)
3. Desolder the capillary tube and the suction line from the evaporator.
4. Remove the evaporator.
5. With a file, score the capillary tube just upstream of the soldered point. Break off the soldered section to help prevent solder from plugging the tube during soldering.
6. Place a new evaporator and braze the suction and capillary tube to evaporator using silver solder.
7. Install a replacement dryer.
8. Evacuate and recharge the system using reasonable procedures.



Evaporator in Freezer

Evaporator is located in the bottom of freezer to produce cold air driven across the evaporator coils.

1. Take off the ductwork in Freezer.
2. Disconnect the wire connector (Heater, Bimental, and Thermistor).
3. Desolder the inlet and outlet tubes.
4. Remove the evaporator.
5. Take the same steps to seal the system as mentioned earlier.

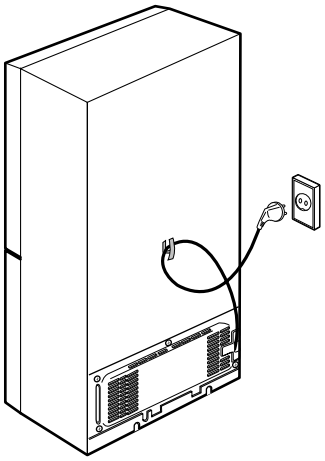


Mechanical Disassembly

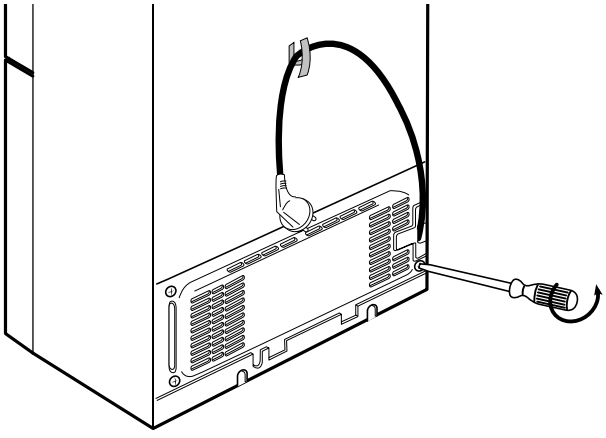
Machine Compartment & Electric Box

Warning Make sure the power cord is unplugged before replacing any electric components.

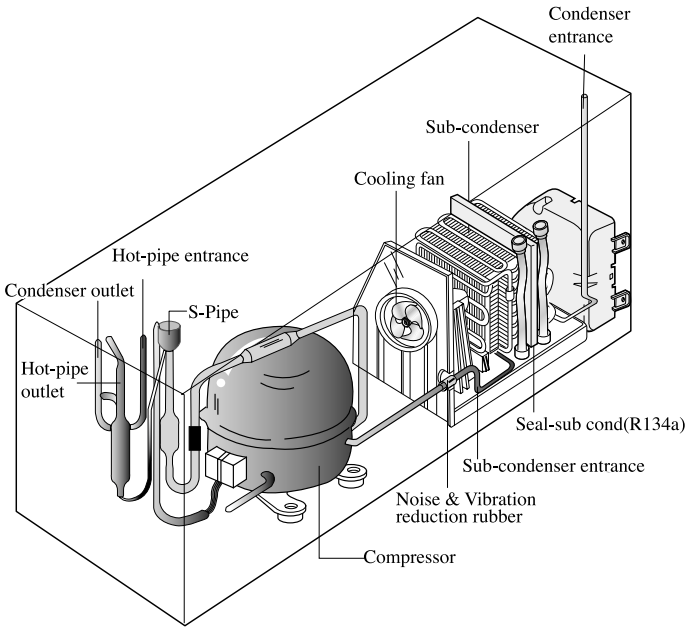
1. Unplug the power cord.



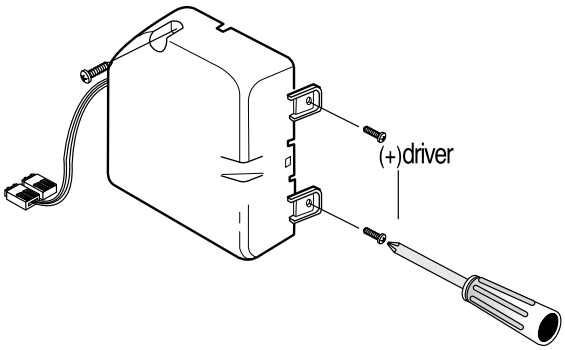
2. Remove the screws of the compartment cover. Slide it up and take out from the refrigerator.



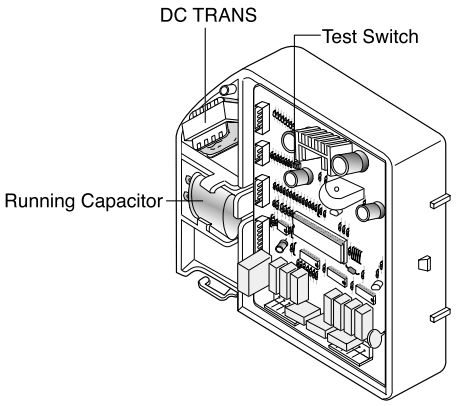
3. Mechine compartment assembly



4. Disassemble the electric box cover after removing the screws with a Phillips screwdriver.



5. Electric box assembly



9. Operation Function

9-1) Digital Panel 20

9-2) Temperature Control Function 20

9-3) Power Freeze and Power cool Functions 20

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9-6) Forced Operation Function 22

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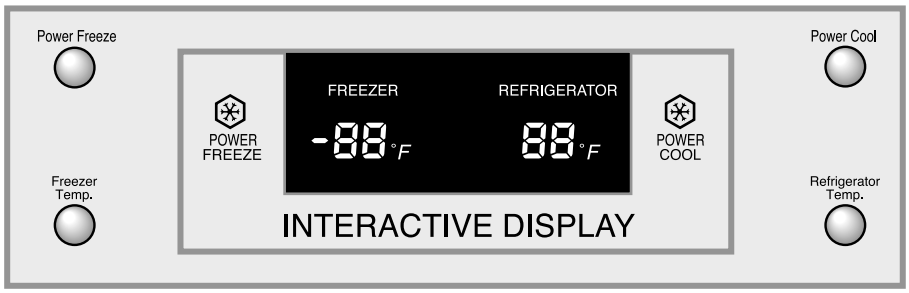
Operation Function

9-1) Digital Panel



9-2) Temperature Control Function

When the system power is initally engaged, the default set temperature are -2℉ for the freezer and 38℉ for the set refrigerator, respectively. The numbers shown on the digital display panel stand for the actual compartments temperatures. When the compartment temperatures go down, so do the numbers on the display panel, and finally they reach the set temperatures. Once the system is stabilized, the display temperatures are the set temperature.

1) Freezer Temperature Control.
To select a set temperature, press the Freezer Temp. button. The display shows the set temperature from -14℉ to 8 ℉ in sequence.
2) Refrigerator Temperature Control.
To select a set temperature, press the Refrigerator Temp. button. The display shown the set temperature from 34℉ to 46℉ in sequence.

note) Because of the temperature sensor sensivity, the refrigerator can be under and/or over cooled when the air flow is blocked by stored foods. (Temperature range of the sensor : 15℉～80℉)
In the event of a power failure, if the freezer temperature is maintained lower than 41℉, the last selected set temperature and functions memorized in EEPROM will be restored when the power is on.

9-3) Power Freeze Function and Power Cool Functions.

- Select the Power Freeze or Power Cool buttons separately.
- These buttons are toggled ON and OFF and the indicators as well.
- Although you select Power Freeze or Power Cool, the set temperatures in the freezer and refrigerator are not changed.
- The set temperatures for the compartments can be changed while these functions are in use.

1) Power Freeze function
1-1) When you press the Power Freeze button, the LED indicator lights right away, but there is 10 seconds lag time to an actual operation. When this button is pressed again, the Power Freeze function stops and the indicator is off immediately .
1-2) If you select Power Freeze, both the compressor and the freezer fan run for 2 ½ hours continuously.
1-3) During Power Freeze, the freezer retains the current settings.
1-4) When Power Freeze expires, the indicator goes off and the freezer set temperature will be restored.

2) Power Cool function
2-1) Power Cool operation and the indicator work exactly same as the Power Freeze function.
2-2) When Power Cool is selected, COMP and R-FAN operate continuosly until the refrigerator reaches 25℉. This function will be terminated after 2 ½ hr running.

3) When you select Power Freeze and Power Cool together
Each function works at the same time. The COMP and F-FAN run continuously and the R-FAN runs until 25°F in the refrigerator.

4) Initial Power-On
4-1) When the freezer and the refrigerator temperatures are higher than 14°F and 50°F, respectively, if Power Freeze is selected, then the R-FAN will be off. If Power Cool is selected, then the F-FAN will be off.
4-2) When both functions are selected, there is no benefit of fast cooling for each compartment.

9-4) Sound Function

1) Sound function
1-1) To make sure a command input, whenever a button is pressed, a "ding-dong" sounds.
1-2) When two or more buttons are pressed simultaneously or if a wrong button is pressed, there is no sound.

2) Door Open Alarm
2-1) When the doors remain open for 2 minutes, there are 10 times beeps.
2-2) If the doors continue to remain open more than 2 minutes, the additional 10 beeps interval will change to 1 minute.
2-3) The beeps will cease immediately when the doors are closed.

9-5) Defrost Function

1) A defrost is determined based on the accumulated compressor on-time.

2) When the power is engaged for the first time, the defrost cycle for the freezer and the refrigerator will begin after 4 hours of the accumulated compressor on-time.

3) A defrost interval depends on the ambient temperature, the number of door openings, and the door open time.

4) The defrost cycle is composed of a pre-cool process (F-Fan and COMP) for 30 minutes, a heating process, and a resting for 8-12 minutes to drain.

5) A minimum interval is 6 hours and a maximum is 11 hours for the refrigerator, and 12 hours and 22 hours for the freezer, respectively.

6) When the system runs only for the refrigerator (R-Fan and COMP) and if the refrigerator can not reach the set temperature within 2 hours, an R-defrost process will begin.

7) After the 6) process, when the compressor on-time reaches 4 hours, R-,F-defrost will begin simultaneously.

8) If a defrost cycle ocurs during Power Freeze operation, the defrost cycle will begin after the completion of Power Freeze operation.

Operation Function

9-6) Forced Operation function (Power cool key + Refrigerator. Temp 8sec.)

- This function enables a pull-down mode, a defrost mode for the refrigerator only, a defrost mode rigerator at the same time, and a cancellation of this function.
- Press Power Freeze and Refrigerator Temp. buttons for 8 seconds simultameously to get in the ready mode for a forced operation.
- The display panel will return to normal after 15 seconds in the ready mode.
- At the ready mode, press any button once to start a pull-down operation, twice for a defrost cycle for the refrigerator, three times for a defrost cycle for the freezer and the refrigerator, and finally four times for cancellation of this function.
- Another way to cancel this function is to simply plug out and in the power cord.

1) Pull-down Operation

1-1) At the ready mode, press any button once then the buzzer will beep (ON for 1/2 second and OFF for 1/2 second) until this mode is cancelled.

1-2) At this pull-down mode, the compressor will start immediately (No 5 minute delay) and if the system is in the defrost cycle, it will be cancelled right away.

note) If this pull-down mode begins right after the compressor was off, the compressor may not start to run due to an overload condition.

1-3) At this mode, the compressor and freezer fan will operate continuously for 24 hours and the refrigerator fan will be on and off according to the set temperature(34˚F)

1-4) After 24 hour operation, the system will be cycled at -14˚F for the freezer and 34˚F for the refrigerator.

1-5) In order to cancel this mode at any time, select the next mode on the ready mode or power off the system.

2) Defrost operation

2-1) At the pull-down mode, press any button again on the ready mode to begin the defrost cycle for the refrigerator.

2-2) The beep sound continues for 3 second at the beginning, then ON for 3/4 seconds and OFF for 1/4 second until this mode cease.

2-3) After this operation, the system will come back to normal operation.

2-4) At this mode, press any button again on the ready mode to operate the defrost cycles for both compartments.

2-5) The beep sound continues for 3 seconds at that time, then ON for 1/4 second and OFF for 3/4 seconds until the defrost operation cease.

3) Cancellation

3-1) At the R,F-Defrost mode, press ant button again on the ready mode to return to a normal operation.

3-2) Simply unplug the power cord, then plug it again to return to a normal operation.

Operation Function

9-7) Power failure compensating function

1) When the freezer temperature is lower than 50˚F, all functions on the display panel will be restored.
2) When the freezer temperature is higher than 50˚F, all functions will be initialized.
(2˚F for the freezer, 38˚F for the refrigerator, and Cubed for the Ice Type)

9-8) Exhibition Function

- This function is for a display purpose on the floor of show room or store.

1) Mode ON/OFF
1-1) For the exhibition mode, press Power Freeze and Freezer Temp. buttons simultaneously for 5 seconds until a “ding-dong” sounds.
1-2) Press the same time buttons again for 5 seconds to cancel this mode put with a “ding-dong” sound.

2) Operation
2-1) Most of the system function except the compressor operation are working properly.
2-2) There is no defrost cycle in this mode.

9-9) Self-Diagnostics function

1) Self-Diagnostics in the initial Power ON
1-1)The control board performs a self diagnostics test within 1 second and check out the temperature sensors abilities.
1-2) If a sensor failure occurs, a corresponding LED segment will blink.
1-3) When a LED segment blinks, only the cancellation function (Press Power Freeze and Power Cool buttons simultaneously for 8 seconds) is acceptable.
1-4) After a replacement of bad sensor or a cancellation of this function, this self diagnostics will end.

2) Self-Diagnostics in the normal operation
2-1) To select this function, press Power Freeze and Power Cool buttons simultaneously for 5 seconds with an audible tone.
2-2) In the self diagnostic mode, only corresponding LED segments will be illuminated (see the check list on)
2-3) After a 30 second illumination of error signal, the system will return to the normal operation.

Operation Function

Table 1. Display table of self diagnosis.

No	Item	LED Display	Details	Remarks
1	R-sensor	REFRIGERATOR 5	• Connector contact failure • Short-circuit	•Suspected to be below -58˚F •Suspected to be over 150˚F
2	R-defroster sensor	REFRIGERATOR d	• Connector contact failure • Short-circuit	•Suspected to be below -58˚F •Suspected to be over 150˚F
3	Outer sensor	FREEZER E5	• Connector contact failure • Short-circuit	•Suspected to be below -58˚F •Suspected to be over 150˚F
4	F-sensor	FREEZER F5	• Connector contact failure • Short-circuit	•Suspected to be below -58˚F •Suspected to be over 150˚F
5	F-defroster sensor	FREEZER d5	• Connector contact failure • Short-circuit	•Suspected to be below -58˚F •Suspected to be over 150˚F

9-10) Component Load Operation Function

1) In the normal operation, press Power Freeze and Power Cool buttons simultaneously for 3 second, then the display panel will blink for 2 seconds.
2) Press Refrigerator Temp. button to get into this check mode with an audible tone.
3) Each illuminating LED segment stands for the component which has an ouput signal from the control board.
4) This mode will terminate automatically after 30 seconds.

Operation Function

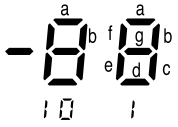
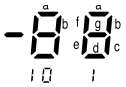


Table 2. Display table of the presently operating parts.

No	Content	Display LED	Operation	Remark
1	R-fan	a : REFRIGERATOR 1 digit	Include R-fan activation	Ref. 6.button scan and display circuitry 
2	R-defrost heater	c : REFRIGERATOR 1 digit	Defrost heater activation	
3	Initial start mode	d : REFRIGERATOR 1 digit	Initial power is activated ON	
4	Over load mode	e : REFRIGERATOR 1 digit	Outer temperature is over 95˚F	
5	Low temp.mode	f : REFRIGERATOR 1 digit	Outer temperature is below 68˚F	
6	Exhibition mode	g : REFRIGERATOR 1 digit	Exhibition mode is operated together	
7	Comp	a : FREEZER 1 digit	Led ON when COMP activation is included	
8	F-fan	b : FREEZER 1 digit	Led ON F-fan activation is included	
9	F-defrost heater	d : FREEZER 1 digit	Led ON when F-heater activation is included	
10	F-Lamp	a : FREEZER 10 digit	Led ON when F-lamp activation is included	
11	R-Lamp	b : FREEZER 10 digit	Led ON when R-lamp activation is included	

※ 3, 4, and 5 only explains the system operation states according to the ambient condition.

9-11) C-Fan Motor Delay Function of the Machine Compartment

l According to the ambient temperature, the condenser fan located in the machine compartment is operated with different modes.

	Ranges of ambient temp.	Operation
C-FAN Delay function	Above 66˚F	C-FAN is ON as soon as the compressor is on.
	61˚F ~ 65˚F	C-FAN is ON with 5 minutes delay from the compressor on.
	Below 60˚F	C-FAN is OFF regardless of the compressor operation.

10. Circuit Descriptions

10-1) Source Power Circuit 27

10-2) Oscillator Circuit 27

10-3) Reset Circuit 28

10-4) Door S/W Sensing Circuit 28

10-5) Temperature Sensing Circuit 29

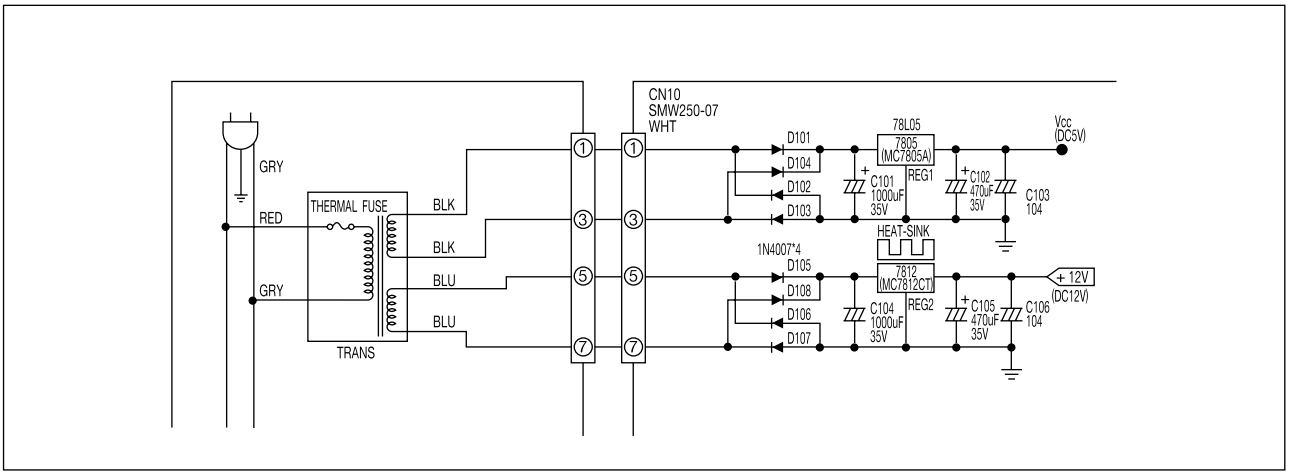
10-6) Key Scan and Display Circuit 30

10-7) Load Drive Circuit 31

10-8) Option Circuit 32

Circuit Descriptions

10-1) Source Power Circuit

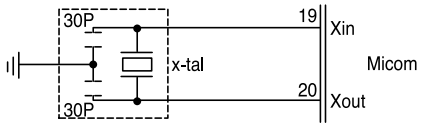


Voltage	Circuit used
+12 (DC 12V)	Relay Operation & LED Display
Vcc (DC 5V)	Power around MICOM & Sensor Detector

1) The input AC voltage drops to AC 8 volts on the transformer secondary side between ①～③ at CN 10. The rectified voltage passed through D101 ~ 104 becomes DC 5V through voltage regulator MC7805(REG1).
This (DC5V) is supplied to the control board and sensor's circuits.

2) The input AC Voltage drops to AC 15 volts on the transformer secondary side between ⑤～⑦ at CN 10. The rectified voltage passed through D105 ~ D108 becomes DC 12V through voltage regulator MC7812CT (REG2).
This (DC12V) is supplied to the relay operation and LED display.

10-2) Oscillator circuit



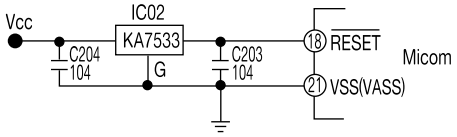
Port	Oscillating Frequency
Xin(#19)	4.00MHz
Xout(#20)	4.00MHz

±0.5% Error

It is designed for clock generation and time calculation for synchronizing transmission and reception on the logic elements inside the MICOM. If the X-TAL specification changes, MICOM may make an error.
(The standard components should be used.)

Circuit Descriptions

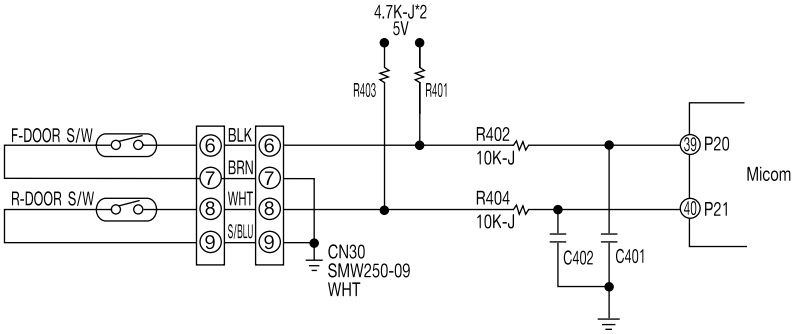
10-3)Reset Circuit



Port	Voltage
Vcc	DC 5V
Reset	DC 5V

When the power is supplied to MICOM, the reset circuit initializes RAM and other sectors of MICOM. A reset voltage maintains “low” for hundreds of μsec comparing to MICOM Vcc voltage when the power is in. It also maintains “high”(5V) during normal operation. But, when Vcc drops to 3.4V-3.7V, a reset port becomes “low”.

10-4) Door S/W Sensing Circuit

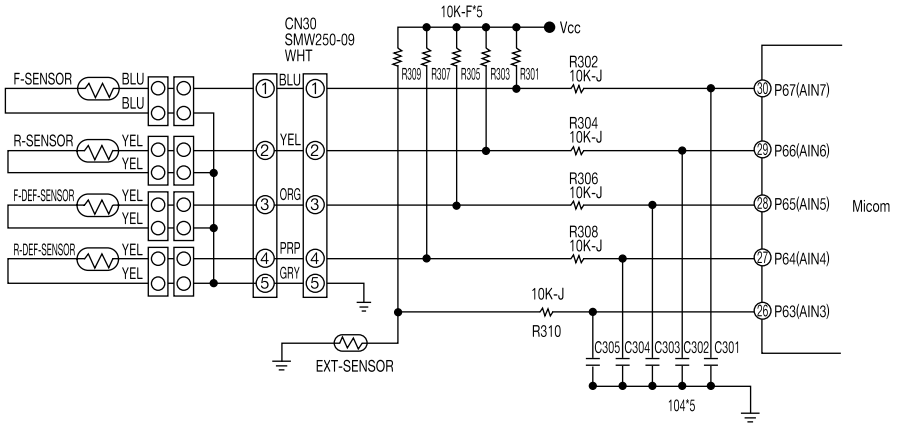


DOOR	Door Conditions	Door S/W Contact	MICOM PIN NO	Micom Input Voltage
F	CLOSE	OPEN	# 39	“HIGH”
	OPEN	CLOSE		“LOW”
R	CLOSE	OPEN	# 40	“HIGH”
	OPEN	CLOSE		“LOW”

1) If a door is open, the door S/W contact is closed. Then MICOM receives “low” signal and detects door open, A relay control circuit receives “HIGH” signal and turn Lamp on.
2) If a door is closed, the door S/W contact is open. Then MICOM receives “high” signal and detects door close, A relay control circuit receives “LOW” signal and turn Lamp off.

Circuit Descriptions

10-5) Temperature Sensing Circuit



(Air Sensor)

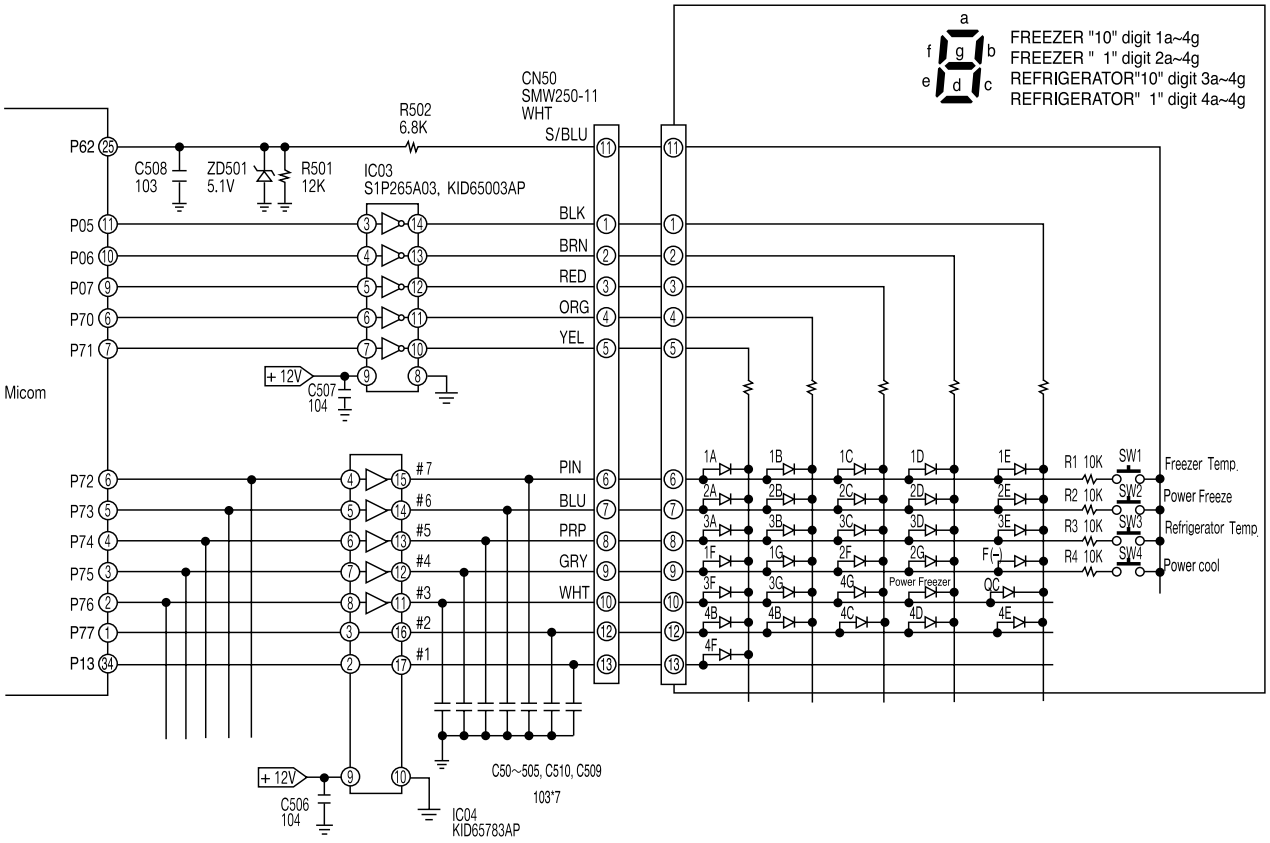
When Sensor is open	When sensor is cut off
MICOM input “HIGH”	MICOM input “LOW”

1) The sensor uses the characteristics of thermistor. If temperature goes higher, resistance goes lower. On the contrary, if temperature goes lower, resistance goes higher.
2) A MICOM input voltage is calculated by sensor as follows.

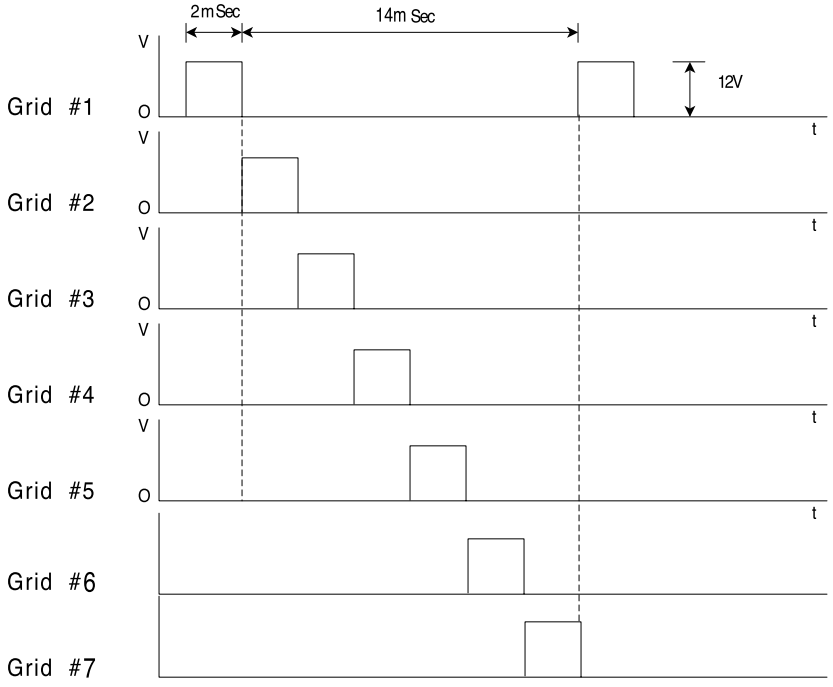
$$V_F = \frac{R_{TH}}{R_{TH} + R_{301}} \times Vcc$$ (V_{CC} : 5V, R_{TH} : Sensor reisitance)

3) For the resistance data corresponding to a temperature and a MICOM input voltage, please refer the conversion table on the back.

10-6) Key Scan and Display Circuit

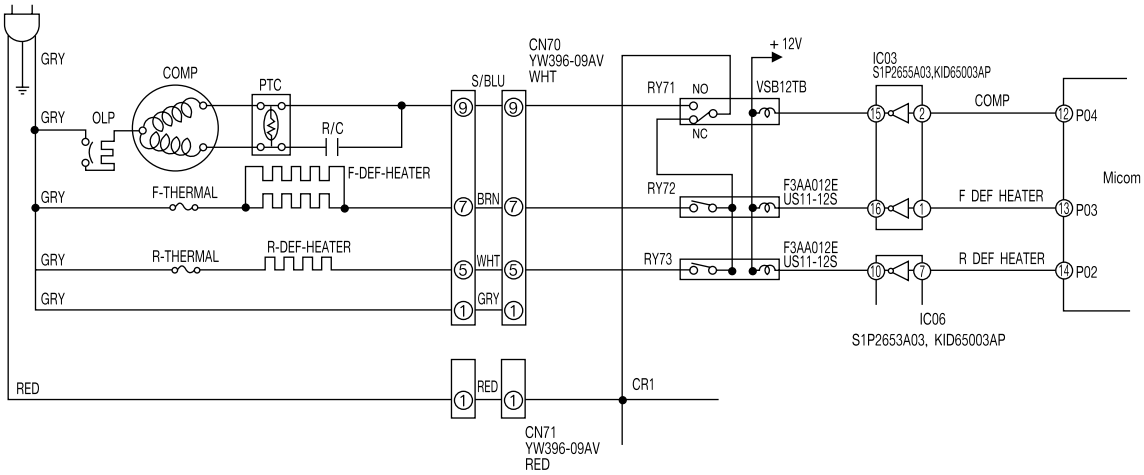


If the IC04 decorder(KID65783AD) receives signals from MLCOM pins(34-6), an output signal per 2 miliseconds comes out from Grid#1-#7. A step DC12 volt peak will be generated periodically as follows:



Circuit Descriptions

10-7) Load Drive Circuit



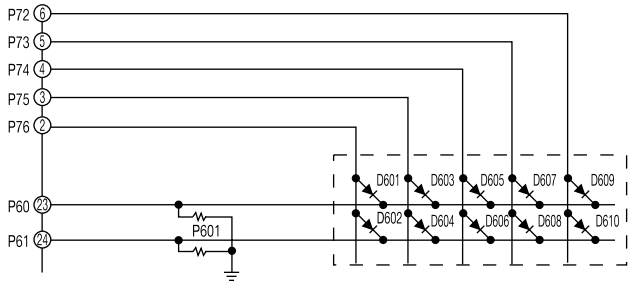
1) Most of relays can control the compressor, heaters and several option functions.
2) For the compressor, #12 pin of MICOM signals HIGH(5V). This signal enters to #2 of IC03 and #15 of output terminal will be on and grounded. When the rely RY71 is switched to NO terminal a 115V power is supplied to the compressor. If MICOM outputs LOW(0V), the compressor will stop.
3) If the RY71 is connected to NC, RY72 and 73 for defrost heaters will be on and corresponding heater.

RELAY		Load	Remark
COMP	Defrost Heater		
on	off	Comp Operation	Defrost-Heater Power Off
on	on	Comp off, Defrost-Heater Off	
off	on	Defrost-Heater On	Comp Power Off
off	off	Comp Off, Defrost-Heater Off	

Will be activated according to the signal from MICOM. Like the above block diagram, operation of F, R defrost heater is determined by the operation of the relay for COMP.

Circuit Descriptions

10-8) Option Circuit



Temperature and function values can be abjustable by using main PCB switching diode.

• Note : the values have been preset in factory. If is recommended not to change the value arbitrarily. When the option function is modified, a power should be turned off and on, again.

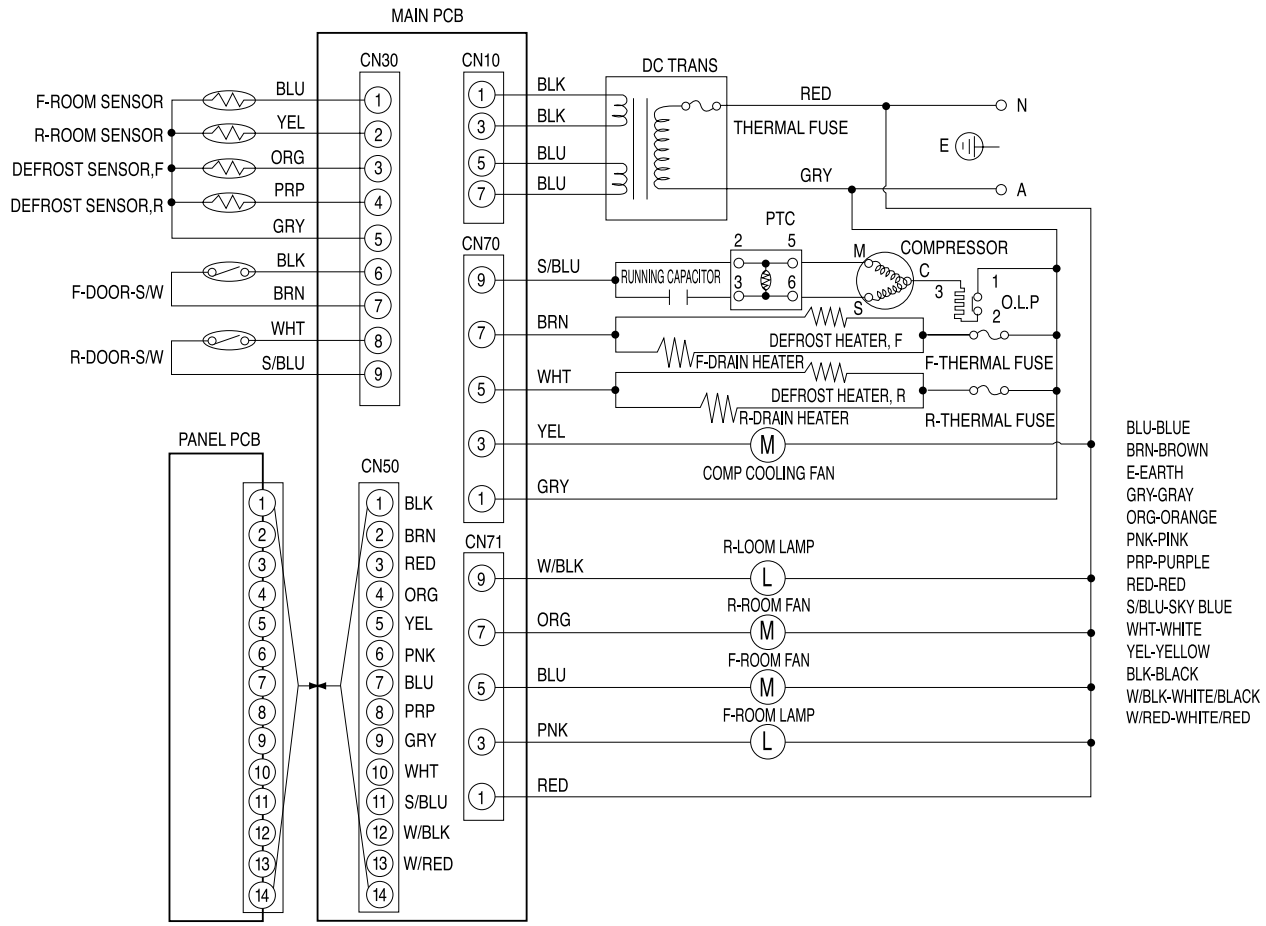
1) Freezer Temperature Shift (Unit ˚F)

SHIFT	D601	D602	D603
Reference	-	-	-
-1.0	-	-	●
-2.0	-	●	-
-4.0	-	●	●
-6.0	●	-	-
+2.0	●	-	●
+4.0	●	●	-
+6.0	●	●	●

2) Refrigerator Temperature Shift (Unit ˚F)

SHIFT	D604	D605	D606
Reference	-	-	-
-1.0	-	-	●
-2.0	-	●	-
-4.0	-	●	●
-6.0	●	-	-
+2.0	●	-	●
+4.0	●	●	-
+6.0	●	●	●

Circuit Descriptions



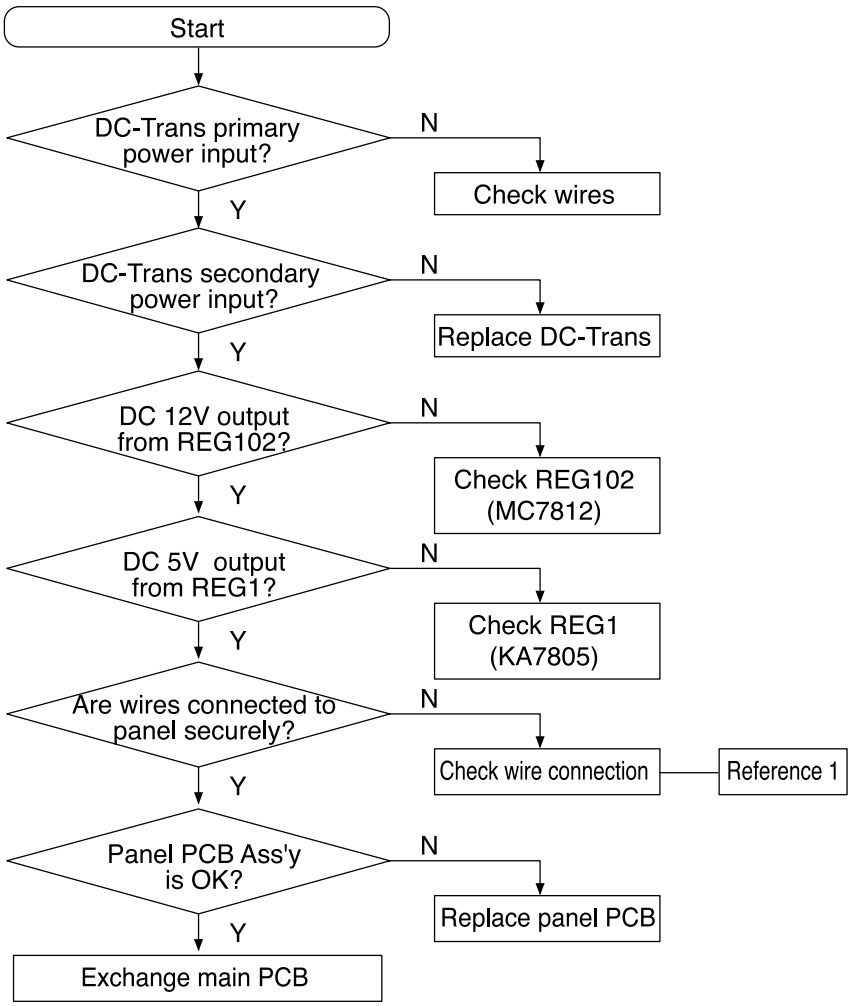
11. Diagnostics

11-1) If power is not ON

Caution!

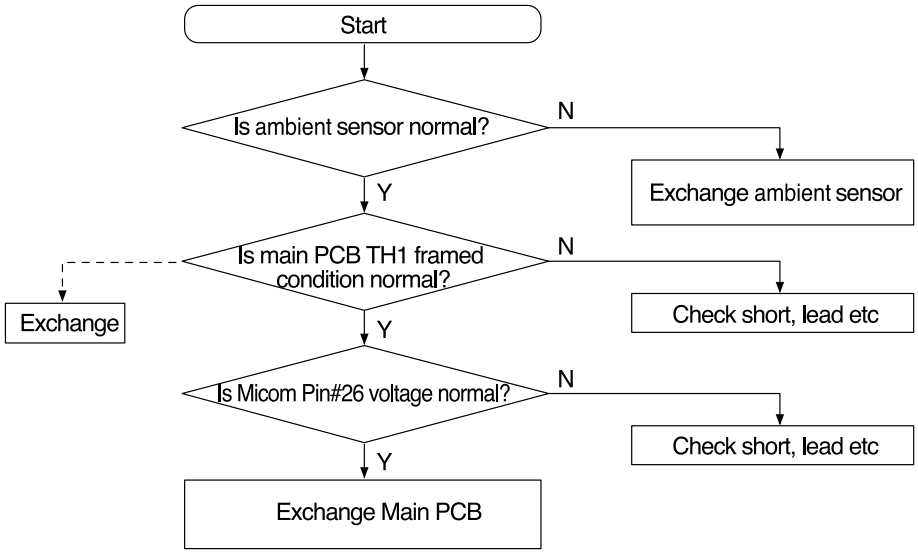
At the power of main PCB, the 115V power and a high-voltage over DC 170V occur. Special care should be advised on repair and measurement.

To check the main PCB, please apply descriptions of operation and references in the manual.

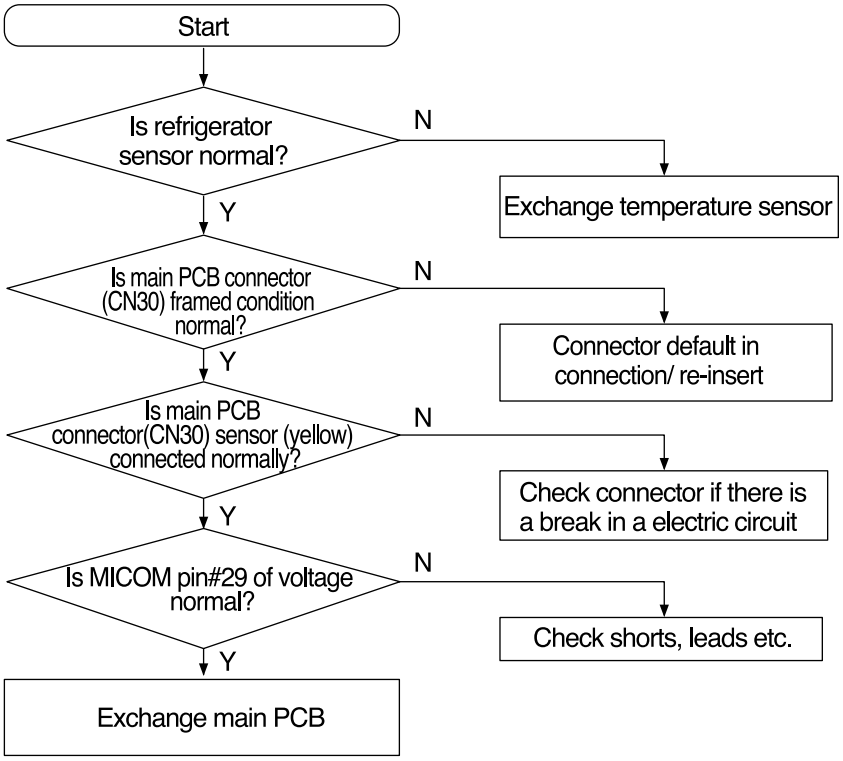


11-2) If there is a trouble with self-diagnosis

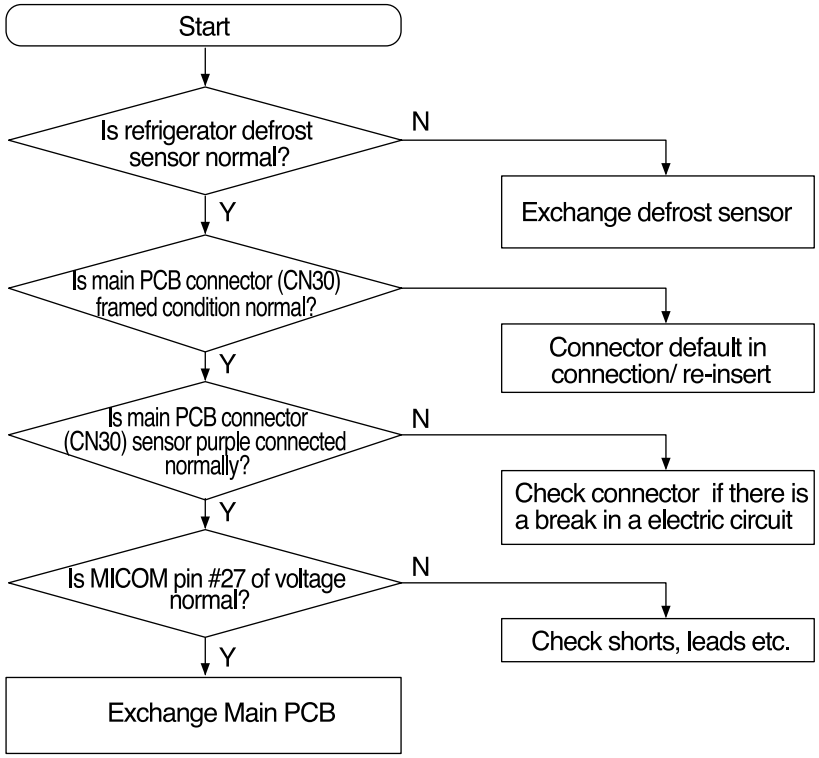
1) If the ambient sensor has trouble.



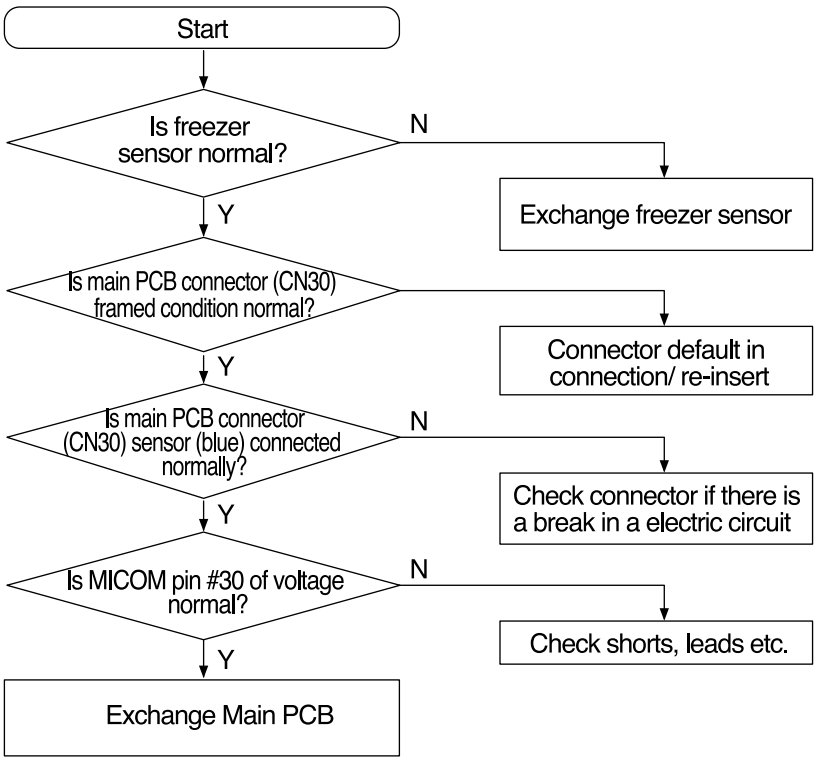
2) If the temperature sensor of the refrigerator has trouble.



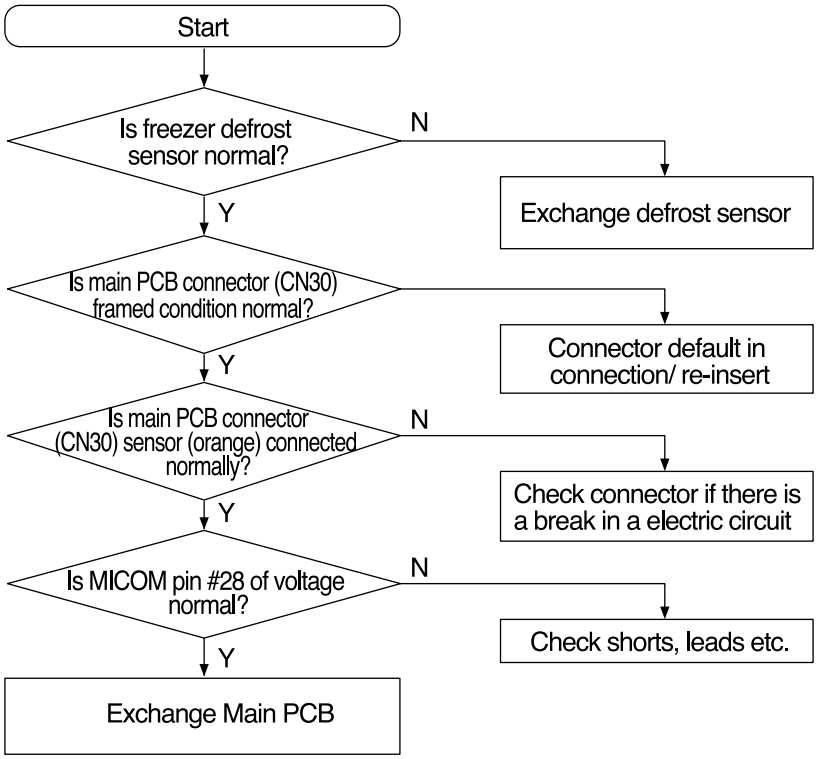
3) If the defrost sensor of the refrigerator has trouble.



4) If the temperature sensor of the freezer has trouble.



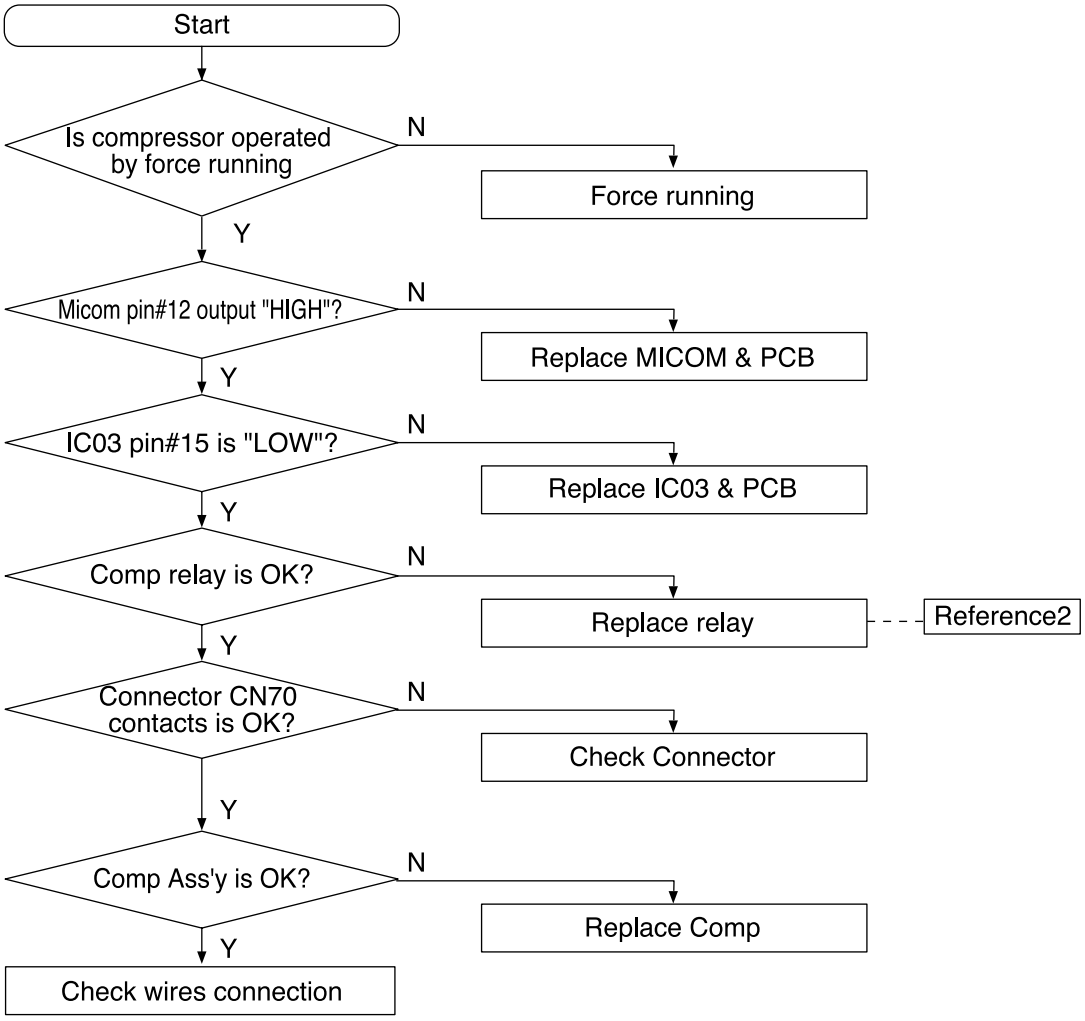
5) If the defrost sensor of the freezer has trouble.



11-3) If the compressor is not working properly

Pre-check

1. A compressor does not operate within 5 minutes after compressor is OFF.
2. A compressor does not run during defrost period
3. A compressor does not run because a low temperature is detected if freezer and the refrigerator sensor are not connected.



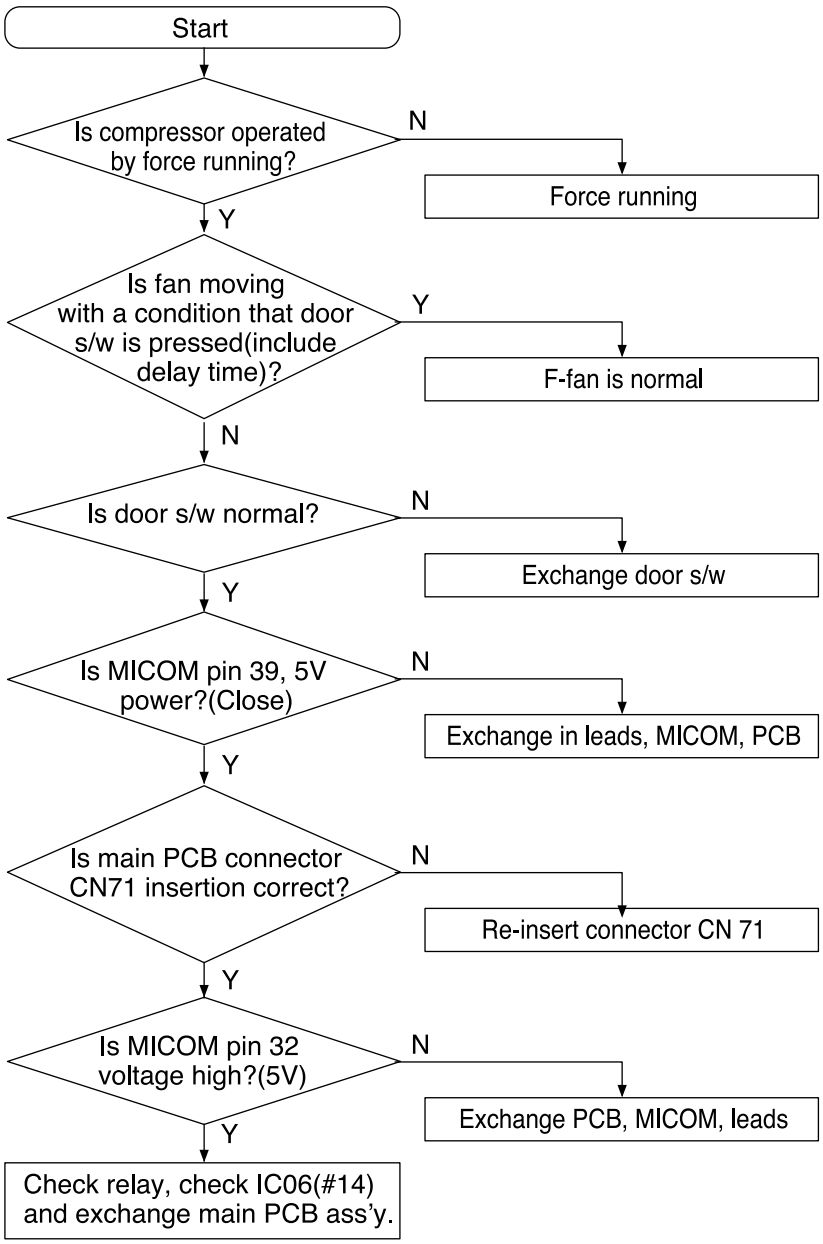
11-4) If cooling fan doesn't work

Pre-check

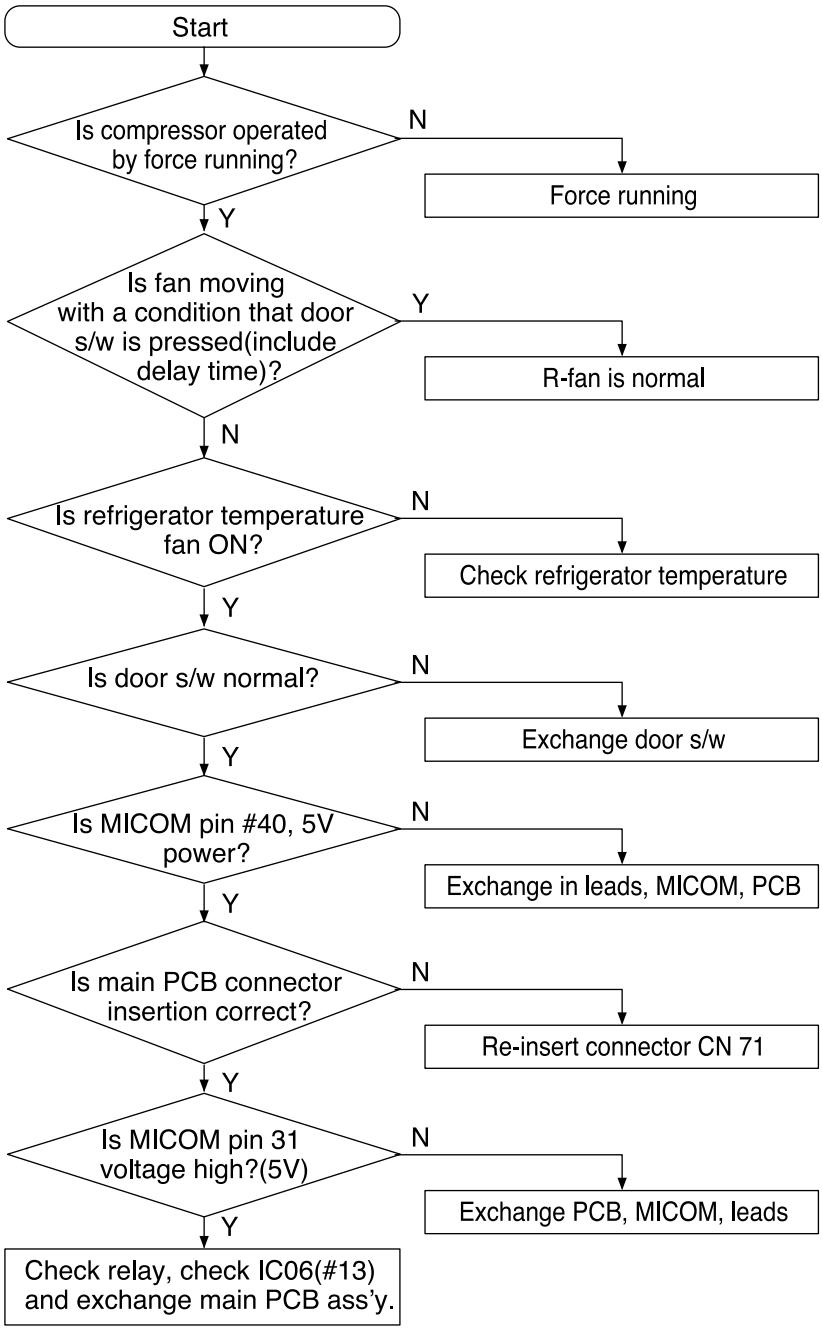
Select a pull-down mode from the forced operation function

1. When COMP is OFF both freezer and the refrigerator cooling fans and COMP cooling fan remain OFF.
2 . When COMP is ON, the refrigerator fan is not always ON and when the refrigerator temperature reached a set temperature, the fan goes OFF.
3. When both the freezer and the refrigerator doors are closed, each fan has a delay time (5sec ~ 1 min) and then degins to run. (COMP ON condition)

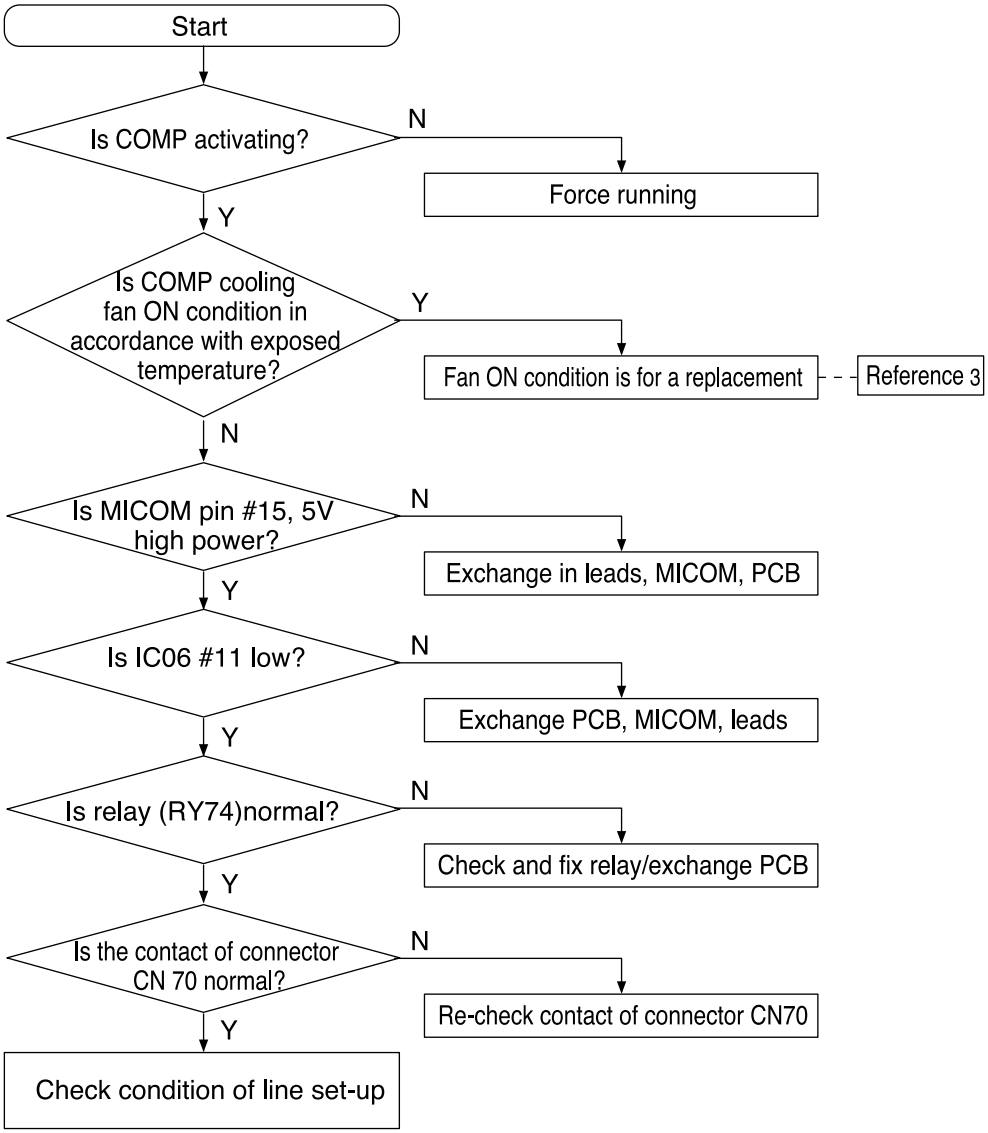
4-1) When freezer fan (F-fan) do not operate



11-5) If the refrigerator fan doesn't work



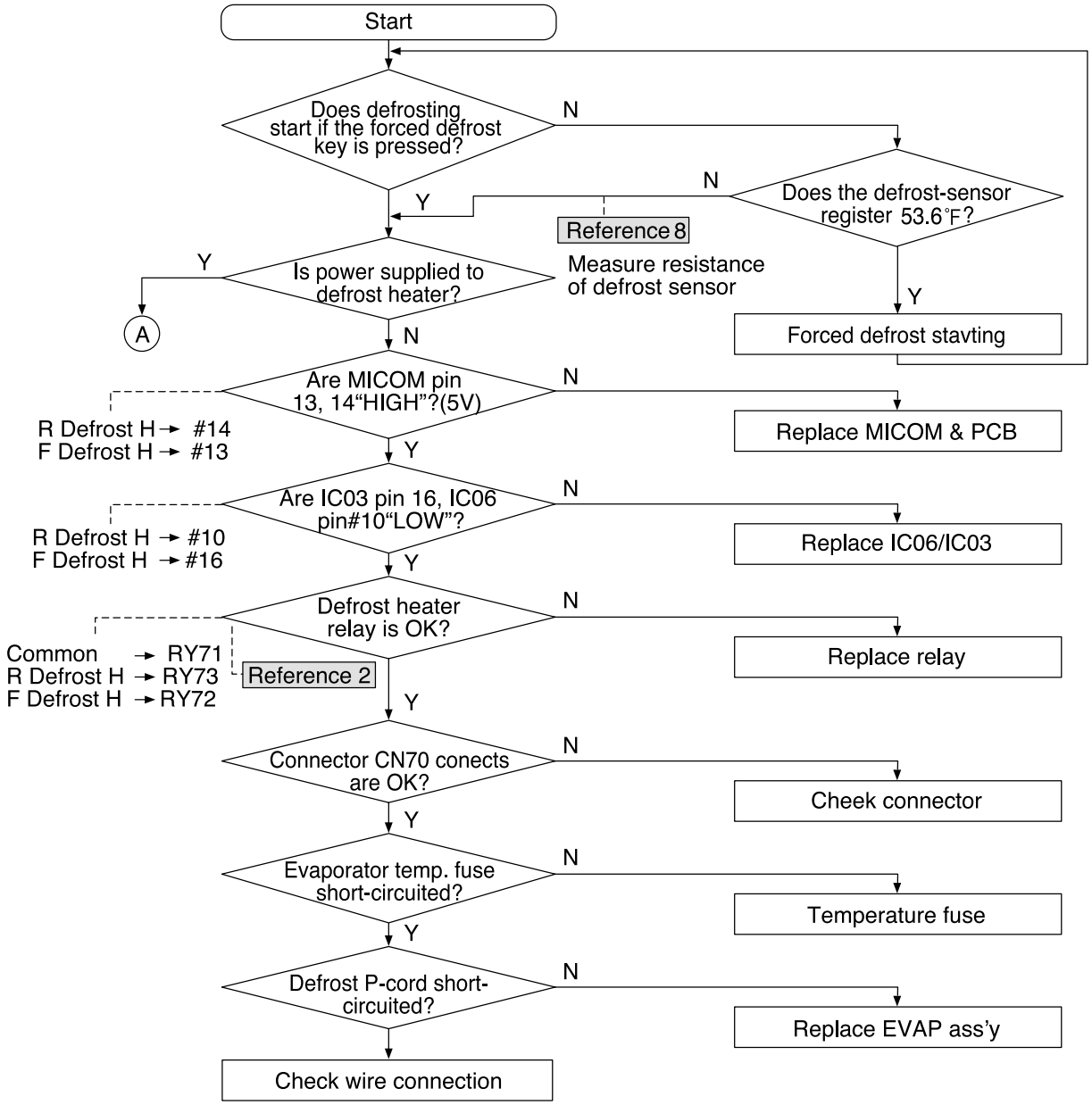
11-6) If the compressor cooling fan motor doesn't work

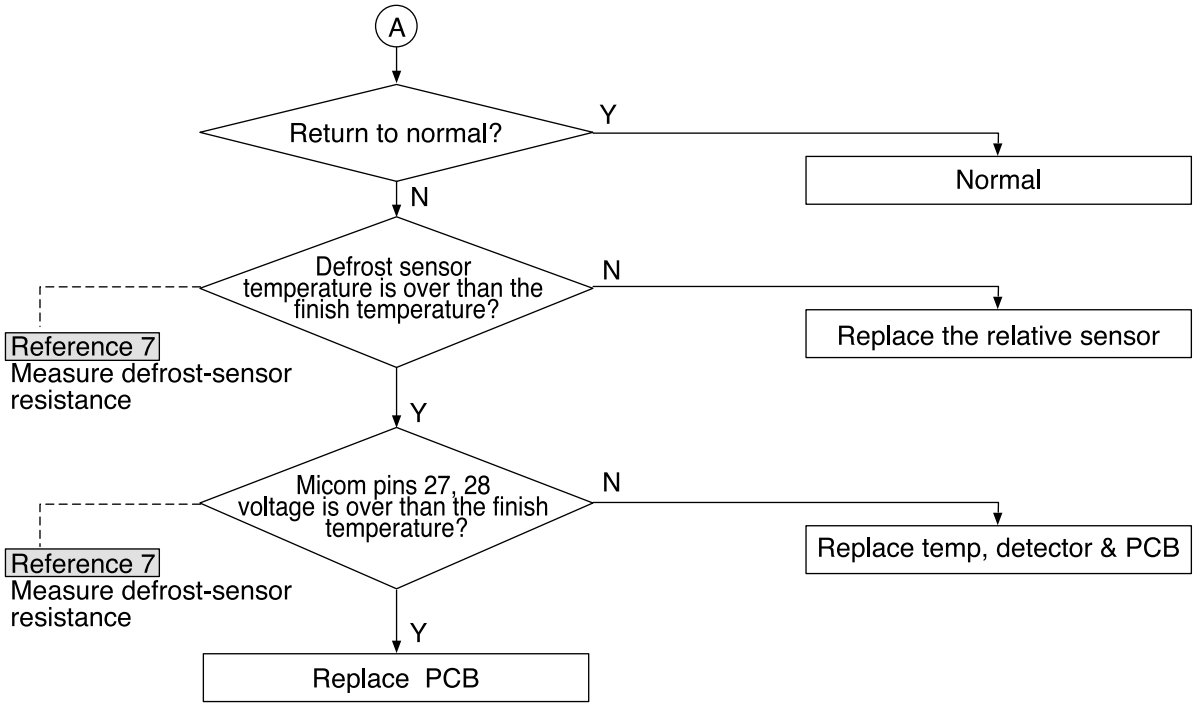


11-7) No defrosting

Pre-check

1. Although both F • R-defrost sensors have short-circuit, a normal operation continues without a defrost cycle (Refer to self - diagnostics function)
2. When the temperature fuse is open, there is no heating and a defrost occurs naturally by the compartment temperature increase and eventually, it will cause a blinking of temperature.
3. When both F • R-defrost sensors are open, heating does not end. The compressor remains off and a temperature fuse will be open. (Refer to self-diagnostics function.)



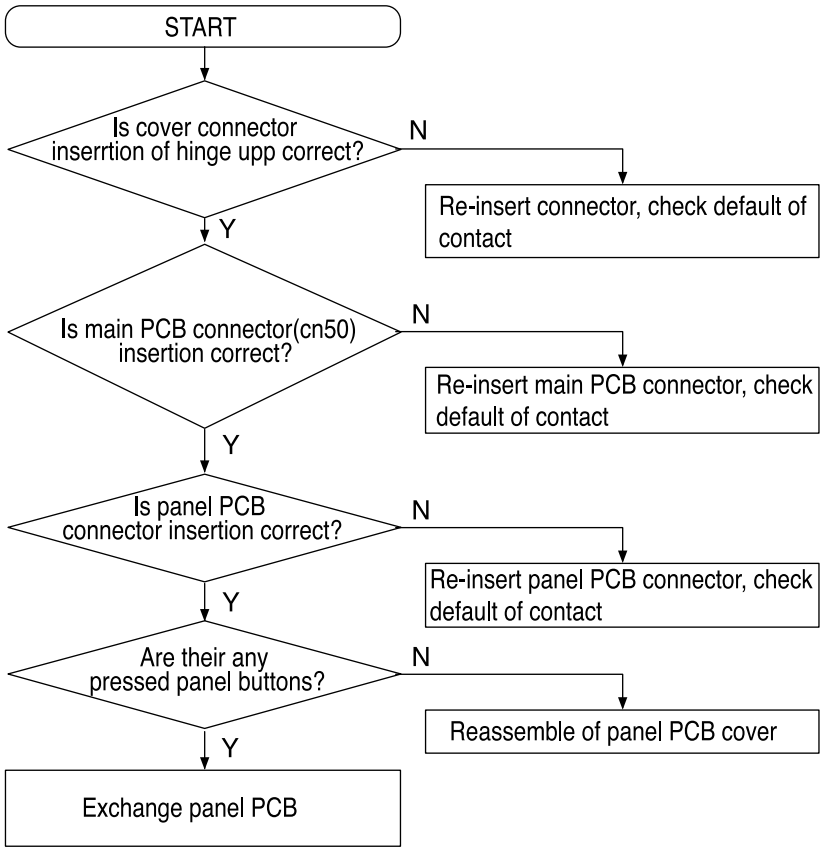

A
Return to normal?
Y
Normal
N
Defrost sensor temperature is over than the finish temperature?
N
Replace the relative sensor
Reference 7
Measure defrost-sensor resistance
Y
Micom pins 27, 28 voltage is over than the finish temperature?
N
Replace temp, detector & PCB
Reference 7
Measure defrost-sensor resistance
Y
Replace PCB

11-8) Alarm continuously

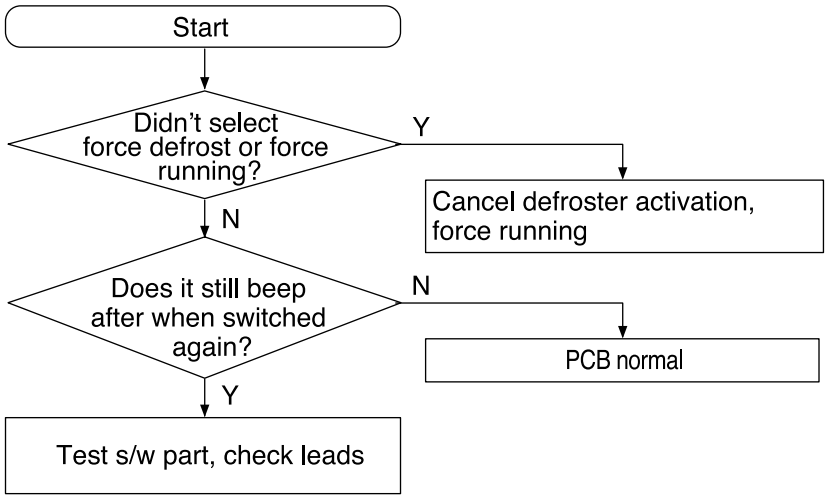
Pre-check

1. Alarm begins after 2 minutes when the door is open and runs in every 2 minutes.
2. If the door is not closed properly, MICOM will indicate that the door is open, and alarm continues. If the alam goes for 10 minutes, the light in the compartment will be off and not be on in the situation that the door opens.

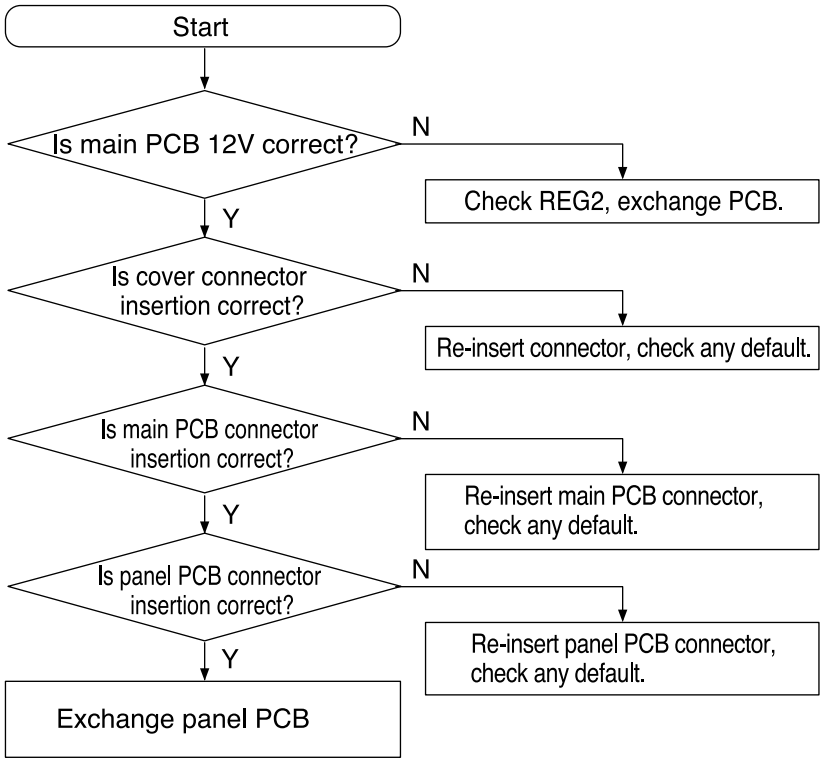
1) If melody sounds continuously



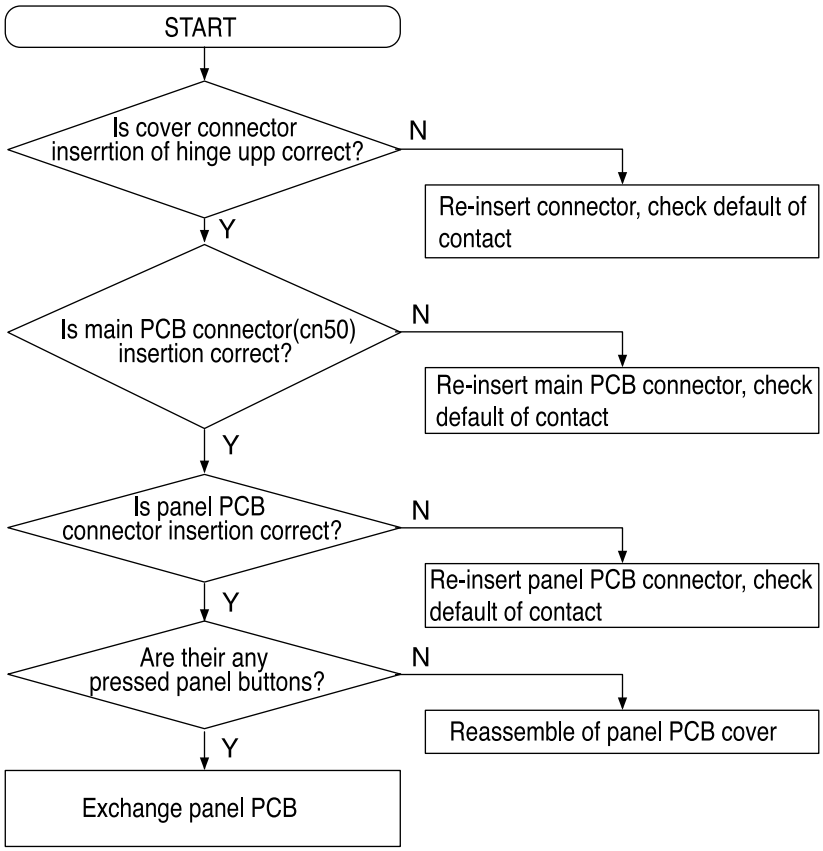
2) If beep sounds continuously



3) When the digital panel PCB does not light



4) When a button of the digital panel is not selected

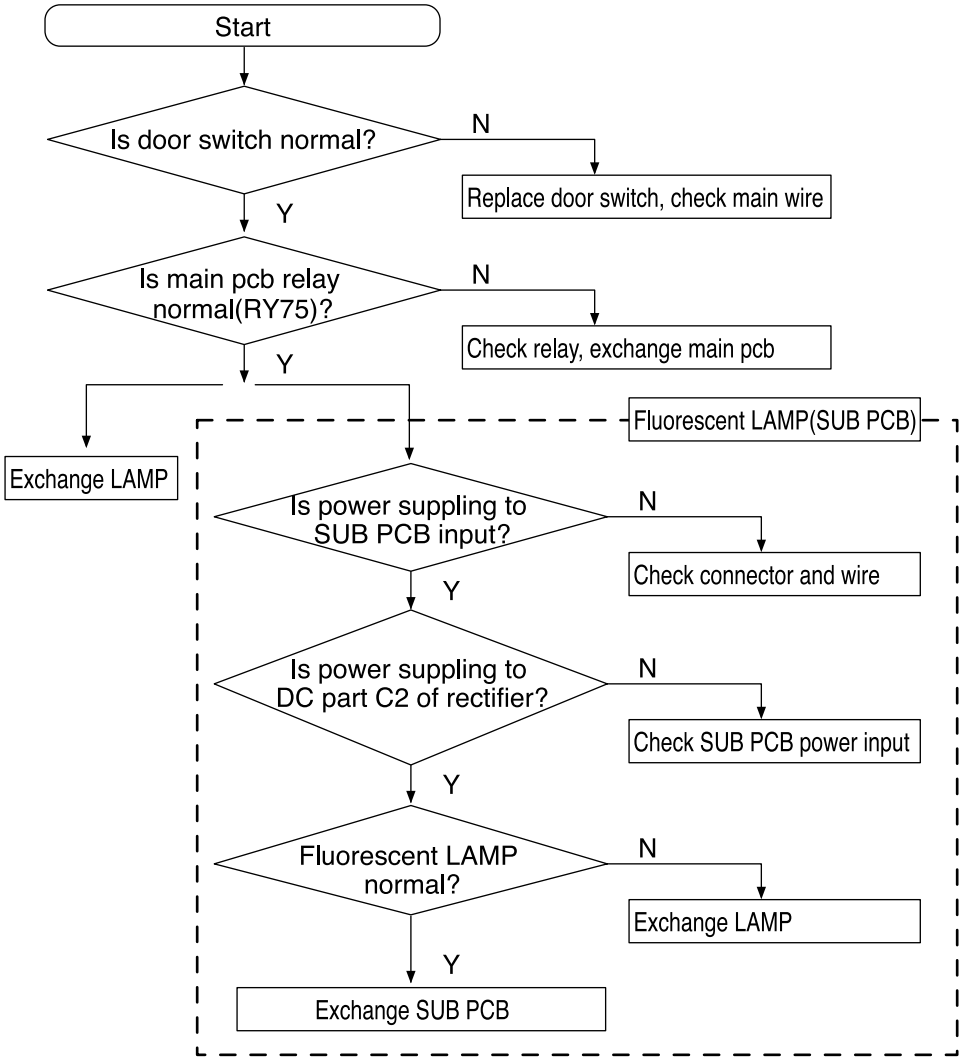


Diagnostics

Pre-check

1. Is the power cord connected to a wall outlet correctly?
2. Be careful of high-voltage, high-frequency discharge from the electronic ballast.

5) If the lamp of refrigerator fails to light



13. Safety Instructions on Service

- Unplug the refrigerator before making any repair or any replacement.
  ⇨ Avoid the electric shock.

- Use the rated components on the replacement.
  ⇨ Check the correct model number, rated voltage, rated current, operating temperature and so on.

- On repair, be sure that the wires such as harness are bundled tightly and are not exposed by water.
  ⇨ Bundle wires tightly in order not to be detached by the external force.

- On repair, remove completely dust, particles or other things on housing parts, harness parts, and connectors.
  ⇨ Cleaning may prevent fire by tracking or short.

- Check if there is any trace indicating the infitration of water on electrical parts.
  ⇨ If there is a trace, change the related components or do the necessary action such as taping using the insulating tape.

- After repair, check the assembled state of parts.
  ⇨ It must be the same assembled state as before.

- Check the surrounding conditions of the installed refrigerator.
  ⇨ When the refrigerator is located at humid or wet place, or the installed state is unstable, change the location.

- If needed, do the ground.
  ⇨ Especially, if there is a possibility of the electric leakage, this appliance must be properly grounded.

- Do not allow consumers to use one outlet for several plugs.

- Check if the power cord is placed under other appliance and so was damaged, worm-out and squeezed.
  ⇨Repair defective power plug or outlet immediately.
  ⇨Make sure that the power cord is not placed under other appliance or squeezed.

- Do not allow consumers to keep bottles or the likes in the Freezer or to keep foods in unstable position.

- Do not allow consumers to repair the appliance by themselves.

- Do not allow consumers to keep other chemicals except food.
  ⇨Medicines and other materials for research ; This appliance will not maintain the precisely constant temperature for them.
  ⇨Volatile material(Alcohol, Benzene, Ether, LP gas etc.) : possibility of explosion

11. PCB Circuit Diagram